University of Connecticut Health Center
CLAC Tower Renovation Project

ADDENDUM #03

August 19, 2013

A. General Requirements

When submitting your proposal, please indicate acknowledgment of this Addendum under "Addenda" in Exhibit "F". Include any price adjustments necessary as a result of new/revised bid documents under Exhibit "F" – Pricing Schedule.

All bidders are reminded that their specific scope may reference or include work that is in a specification section shared by another bid package or trade. All scopes are to be complete systems, specifications and drawings describe the components and the specific scope of work identifies who is performing the work. For example, Unit #23B is providing Air Valves specified in section 230910, however, the Unit #23C contractor is responsible for many of the other components specified in the same specification section.

B. Schedule

No changes to the schedule have been made in this addendum.

C. Attachments

Please review all attachments in their entirety for inclusion into the base bid documents.

Included in this Addendum are the following:

1. **Pre-Bid Meeting Minutes, for Pre-Bid Meetings held on 8/12/13 and 8/13/13 at 3:30PM.**
2. **Location Plan indicating the location of rooms LB030 and LB006/LB008 for the transition scope.**
3. **Architectural Addendum B, issued by Perkins + Will, dated August 16, 2013, inclusive of the following document revisions:**
   a. **Bid Phase RFI #s 1 – 31 Responses**
   b. **Revised Specification Section 237200 – Air-to-Air Energy Recovery Equipment**
   c. **Revised Drawings AD-100; AD-108; A-100; A-108; A-110; S-110; MEP-302; MEP-303; HD-100B; H-100B; H-100B.1; H-103; H-105; H-107; H-107.1; H-600; H-601; H-602; H-603; H-604; T-301**

D. Scope/Alternate Modifications as follows:

Unit #02A Scope Modifications

Modify the following scope item in Exhibit B:

6. Remove all items from the building, including wall guards, ~~**fire valve cabinets**~~, partitions, flooring, ceilings (plaster, gypsum, acoustical), walls, casework, steel stairs/landing, shelving, **autoclaves, wall clocks, penthouse cage**, etc. as defined by the contract documents. Basement ~~**in-wall**~~ autoclave~~**s is**~~ **are** to be removed by this contractor.

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Unit #22A Scope Modifications

Modify the following scope items in Exhibit B:

5. Disconnect all existing plumbing fixtures and piping including, but not limited to all HW, CW, waste, vent, gas, process piping, sinks, eye wash stations, animal watering, emergency showers, water heaters, and all associated supports and hangers. **Include disconnection of all equipment scheduled for demolition by others, including AHUs, autoclaves, etc. All demolition materials are to be dropped to the floor and cut into small enough pieces to be efficiently removed by others via the elevator. All pieces must be piled in a neat, orderly and safe manner for removal by others.** Cut, cap and drop all piping at nearest valve or junction to avoid dead legs.

Unit #23A Scope Modifications

Modify the following scope items in Exhibit B:

6. Demolition of all HVAC items per the intent of the drawings. Disconnect, cap and make safe all HVAC piping, pumps, coils, valves, heat exchangers, **steam generator**, etc. **with all associated supports and hangers. Include disconnection of all equipment scheduled for demolition by others, including AHUs, exhaust fans, autoclaves, etc.** All demolition materials are to be dropped to the floor and cut into small enough pieces to be efficiently removed by others via the elevator. All pieces must be piled in a neat, orderly and safe manner for removal by others.

Unit #23B Scope Modifications

Please note the following:

1. Phoenix Air Valves are to be included in the BASE BID pricing. TSI Air Valves are to be included as Alternate #7 pricing (see added Alternate #7 in this Addendum).

Unit #23C Scope Modifications

Please note the following:

1. Phoenix Air Valves are to be included in the BASE BID pricing. TSI Air Valves are to be included as Alternate #7 pricing (see added Alternate #7 in this Addendum).

Unit #26A Scope Modifications

Modify the following scope items in Exhibit B:

4. Decommission, disconnect and drop to the floor all existing electrical, fire alarm and tele/data devices, equipment, raceways, wiring, etc. **with all associated supports and hangers** that is not scheduled/required for re-use. **Include disconnection for all equipment scheduled for demolition, including exhaust fans, AHUs, autoclaves, water heaters, steam generator, etc. (wiring to be removed back to the source).** Schedule shutdowns with ample advance notice for all systems being removed from service.

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Revisions to Alternates as follows:

Add the following Alternate to Exhibit G of the Bid Package:

7. **Alternate #7: This alternate is to furnish and install TSI Air Valves and TSI Laboratory Controls in lieu of BASE BID Phoenix Air Valves and Phoenix Laboratory Controls.**

   Unit 23B: Furnish and install TSI venturi air valves in accordance with specification section 233610. TSI venturi air valves are provided with actuators only. Controllers will be furnished and installed by Unit #23C.

   Unit 23C: Furnish and install TSI laboratory controls meeting the performance requirements of specification sections 233610 and 230910. The air valves will be provided with actuators only. All controllers, wiring, programming, etc. for a fully functional Laboratory Control System is the responsibility of this contractor. Johnson or ALC laboratory control systems may be substituted for the TSI Laboratory Control Systems as voluntary alternates.

PRICE: ADD/DEDUCT AMOUNT $_____.00

END OF ADDENDUM #03

BID DUE DATE: The Bid Date remains Thursday, August 29, 2013 at 9:00 AM.

THE WHITING-TURNER CONTRACTING COMPANY

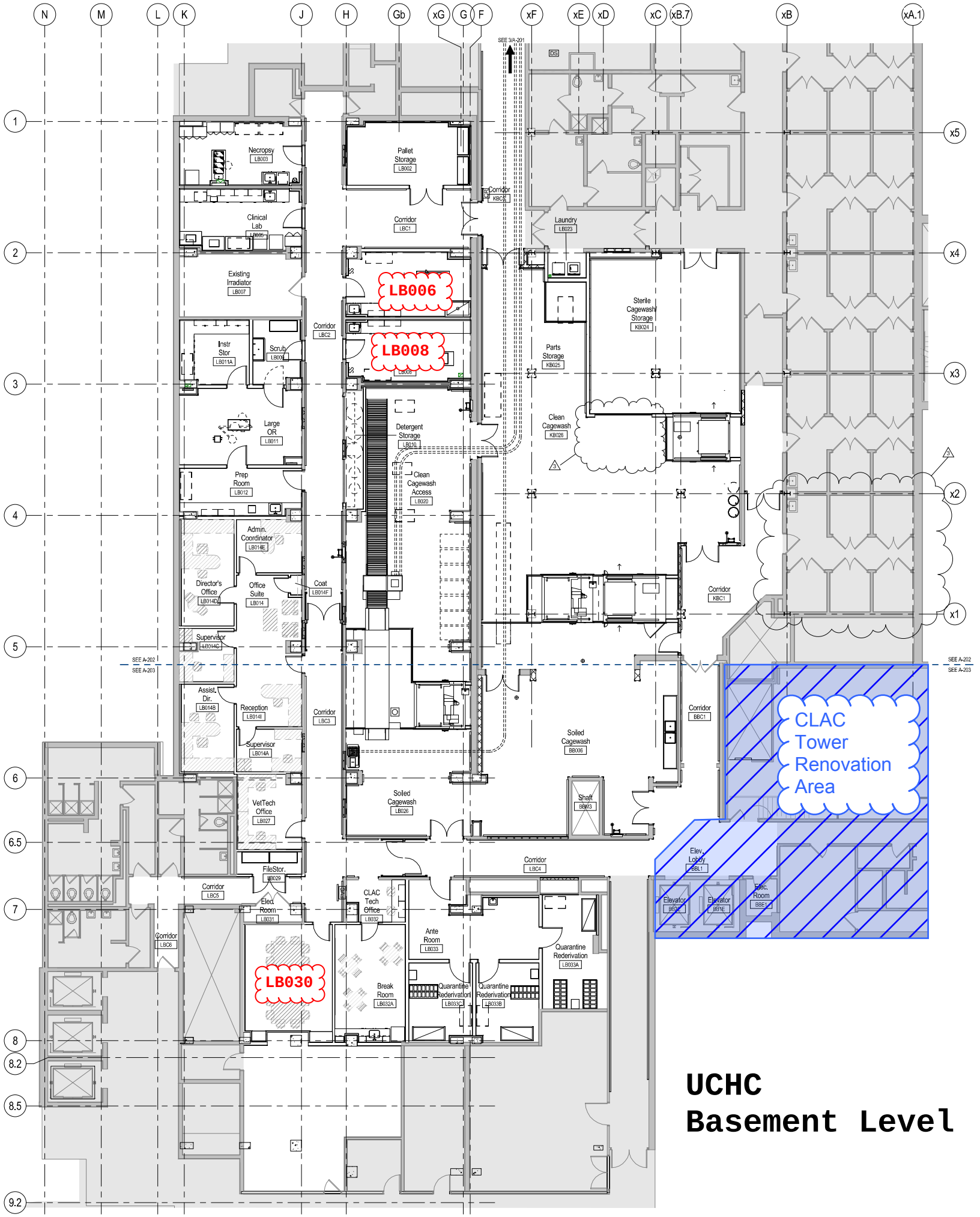
PRE-BID MEETING MINUTES

Prepared By: Todd Werner
Meeting Date: 8/12/13 & 8/13/13
Meeting Time: 3:30 PM
Meeting: Pre-bid Meeting & Walkthrough
Location: 263 Farmington Avenue, Farmington, CT 06030

Pre-Bid Meeting	
1	Whiting-Turner (WT) provided an introduction of the Project Team (WT, Perkins + Wills, BVH Integrated Services, UCHC, and SBS) and a summary of the UCHC CLAC Tower Renovation project.
2	WT noted the project is a HVAC replacement with electrical, plumbing, architectural and other support system updates in an eleven story building.
3	WT noted three floors of the building (Basement, Ground and Main) will remain occupied throughout the renovation. All work in occupied areas is to take place off-hours. In addition, because adjacent areas of the facility may be impacted by shutdown activities, all shutdowns will take place off-hours. All costs associated with off-hours work in occupied spaces and for shutdowns are to be included in each subcontractors base bid. WT emphasized that each Subcontractor needs to be extremely aware of their activities and make provisions to minimize the impact on the surrounding areas.
4	WT noted that Bid/Contract Documents which each bidder is held responsible for are: - WT Construction Administration Handbook (Dated: July 1, 2013) - Form of Proposal and Subcontract (Specific to each Scope of Work and issued to each prequalified bidder via e-mail) - Construction Specifications (Dated: July 17, 2013) - Construction Drawings (Dated: July 17, 2013) - All Addenda (Addendum#1 and Addendum #2 had been issued prior to the Pre-Bid Meetings)
5	WT placed specific emphasis on the need for all bidders to read the Construction Administration Handbook for all general scope of work items, procedural requirements, prevailing wages, logistics plans and other project requirements applicable to all bidders.
6	WT noted there are alternates within the project drawings and specifications which are not included or differ slightly than the alternates described in the Form of Proposal. WT noted alternates should be priced only as listed in the Form of Proposal.
7	WT noted all bidders are responsible to achieve or better the goals of 25% SBE participation and 6.25% MBE participation within their bid. Certified S/MBE contractors and vendors can be found via the DAS Supplier Diversity website. S/MBE certifications must remain valid throughout the construction process for compliance. An overall CHRO plan will be submitted by WT and each subcontractor will follow under WT's CHRO plan. The S/MBE subcontractors and vendors used to achieve these goals must be listed at bid time and cannot be changed after contract execution.
8	WT noted the following important dates: - RFI Final Submission – Thursday, August 15th 2013, by Midnight. - Addenda Distribution – As needed, addenda will be issued on the DAS website, box.com, and via broadcast email to the email addresses provided to WT by bidders. Addenda will not be issued via any other means. - Bid Due – Thursday, August 29th 2013 at 9:00AM in Shelton, CT with public opening shortly thereafter. Late submissions will not be accepted. - Overall Construction Schedule – November 2013 thru November 2014. The Project Milestone Schedule was included in Addendum #2.

9	WT overviewed the following safety requirements and encouraged all bidders to read the complete safety requirements included in the Construction Administration Handbook. • There is no smoking on the UCHC Campus. • All workers are required to pass a background check and wear UCHC issued ID badges. The current cost is $75 per background check which must be conducted yearly. Bidders are required to carry all background check and badging costs within their bid. • All subcontractors will be required to pull their own Hot-Work Permits daily with the UCHC Fire Department • All workers are required to have OSHA 10 training and all foremen are required to have OSHA 30 training. A copy of the OSHA cards must be provided to WT at the safety orientation. Please see the Construction Administration Handbook for more information.
10	WT reviewed the overall site logistics noting there will be a small staging area and access to the building will be via a scaffold platform to the 1st floor window (from parking lot A) and B Tower Elevators from the 1st floor. All materials not being hoisted to the roof level are to take this routing. This scaffold platform is included within the Unit 02A Demolition Package.
11	WT reemphasized the laydown area is limited therefore there will not be any onsite storage. All subcontractors should store materials off-site until installation.
12	WT noted temporary AHU's will be installed and utilized to supply air to the three levels of the building which will remain occupied during renovations. Criteria for the temporary AHU's are listed in the specific scope of applicable bidders.
13	Parking for fifteen (15) vehicles TOTAL for the project is available at the gravel lot near the WT field trailer. Each on-site subcontractor will be allowed one (1) parking spot. Subcontractors are encouraged to identify offsite parking and carpool to the project.
14	SBS reviewed the overall commissioning expectations. • Commissioning meetings will be monthly following project subcontractor meetings. • All MEP installations and systems on the project will require equipment checklists be completed by each subcontractor. • SBS will maintain a web-based issues log to track issues and for subcontractors to respond to issues.
15	All subcontractors are to assume crane work will occur during normal project hours. Craning costs, if required, are the responsibility of the respective subcontractor.
16	All roofing subcontractors are to assume the FM bubble test will not be required for the roofing.

This represents Whiting-Turner's understanding of the items discussed. If the minutes are believed to be incorrect or fail to record discussions at the meeting, please contact preparer immediately. If no dispute is made within two days from receipt of this document, it is assumed that all parties are in agreement and minutes will become a permanent part of the project record.



UCHC
Basement Level

RFI #	Origin	Specification #	Drawing #	Question	Response
1	WT	N/A	N/A	The existing autoclave located in corridor BB005 does not appear in the drawings. Is the autoclave to be demolished or salvaged. Please confirm all the mechanical and electrical services to the equipment should be removed back to the source.	BVH Response - Demolition/salvage of autoclave to be addressed by Arch. Plumbing & Elec services disconnect confirmed. HVAC to add demolition note to drwg. 8/19/13 WT Note: Two autoclaves and one hot water heater to be demolished in this location.
2	WT	N/A	A-804	Please define the scope "refinish the elevator doors" and "refinish to match new doors". Does this include a light sand and paint (latex) on the doors and frame or is stripping all existing finish required?	Scrape existing doors and frames. Repaint to match existing.
3	WT	079200	N/A	Please define the level and location of joint sealants to be used throughout the project. Also, please note Dow Corning 799 has been discontinued and replaced with Dow Corning 1199.	refer to joint sealer schedule in the spec. Dow Corning 1199 is acceptable
4	WT	N/A	18/A-504 29/A-509	1. Are tank restraints required for the tanks farms on the basement or 7th floors? 2. Is a SS pan required at the 7th floor tank farm (similar to the pan at the basement level?	1. Yes 2. No
5	WT	N/A	A-108	Should the roofing on the east and west balcony areas of the penthouse level be replaced? (Previously responded to as "yes" on the pre-bid RFIs #115, but not shown in the documents).	Yes. Updated in Addendum B
6	WT	N/A	FP-108	Should sprinkler coverage be provided at the east and west balcony areas of the penthouse level? If so, should these be dry heads?	BVH Response - No sprinkler coverage required.
7	WT	N/A	P-107 P-108	Should overflow drains be installed at the east and west balcony areas of the penthouse level? (Previously responded to as "yes" on the pre-bid RFs #114, but not shown in the documents).	BVH Response - No overflow drains needed
8	WT	N/A	A-104	Please provide a door, frame and hardware set to access room B4005A.	Updated for Addendum B.
9	WT	N/A	ADs FPs FP-400	General note #8 on the AD drawings state to remove the fire valve cabinets. The FP drawings show the cabinet as existing. Should the demo note be removed to correlate with the FP drawings?	All valves and cabinets are to remain. The FP drawings are correct.
10	WT	N/A	A-201 (etc.)	The fire extinguisher cabinet is shown as surface mounted to the shaft in corridor B1003 (and all upper levels). We have had issues mounting items on shaft walls in previous projects. Is this location acceptable to the building department?	Place new FE's in the abandoned hose reel cabinets.

11	WT	N/A	A-500 thru A-505	Please provide a specification or detail for VHP Ports shown on room elevations.	PW to provide in future addenda
12	WT	N/A	N/A	No lightning protection is shown. Is there an existing lightning protection system? If so, is lightning protection to be added to any equipment for this project?	BVH Response - This building is not presently protected via a lightning protection sysem.
13	WT	N/A	H-108 & H108E	No snow melt system is shown at the intake to AHU-1S. Should a snow melt system be added? If so, please provide a specification and power feed.	BVH Response - Not required at this time.
14	WT	230900, 260500 & 262923	MEP-203 & E-401	Please provide a specification for electrical metering equipment shown on drawing MEP-203, and E-401 and referenced in specification sections 230900, 260500, and 262923.	BVH Response - Elec will provide applicable specifications in future addenda.
15	WT	N/A	N/A	There is an existing clock system located in the elevator lobby of each floor. Is this system to remain, be removed, or be replaced?	Remove all wall mounted clocks and associated systems. Patch and repair walls as required
16	WT	N/A	A-000	Please add fire extinguisher cabinet heights to the typical mounting heights detail on drawing A-000	mount fire extinguisher cabinet so that the FE controls are 48" above the finished floor
17	WT	N/A	AD-108	There is an existing fence/cage system in the penthouse near the east wall. Is this system to remain, be removed, or be replaced?	Cage is to remain unless UCHC decides otherwise 8/19/13 WT Note - Unit 02A to remove cage.
18	WT	N/A	3/A-100	Detail 3/A-100 indicates a horizontal and vertical shaftwall at the bottom of the South shaft. Can the vertical shaftwall be eliminated as the horizontal shaftwall will provide the rating for the shaft?	The vertical shaftwall can stop at basement level, provide horizontal closure between basement and sub-basement. Note on drawing updated for Addendum B
19	WT	N/A	A-100, A-107, P100B & P107	CO2 outlets and CO2/O2 manifolds are shown to be furnished by the Owner/Vendor. UCHC has indicated they would like the project to provide all lab manifolds and outlets. Please provide a specification for manifolds and outlets.	BVH to provide specifications in future addenda
20	WT	123554-3.9	N/A	The cagewash sink and faucet schedule in specification section 123554-3.9 does not appear to apply to this project. Should this schedule be disregarded?	BVH to provide response in future addenda
21	WT	N/A	AD-101 & A-101	Note #35 on AD-101 and General Demo Note #5 on AD-101 indicate all existing wall bumpers are to be removed. A note on drawing A-101 indicates “New and existing to remain” in the corridor. Please clarify which is correct.	This note says that new bumpers are to be applied to all existing and new walls, not that there are existing and new bumpers.
22	WT	N/A	A-500 thru A-506	Please confirm all corridors are to receive crash rails at two elevations and holding rooms are to receive crash rails at only one elevation.	Confirmed

23	WT	N/A	A-100 thru A-107	Please clarify which rooms will have the trench drains infilled and the floors leveled.	PW to provide in future addenda
24	WT	N/A	AD-108 & A-108	AD-108 shows removal of all ceiling panels above the West porch. A-108 shows most of these panels are to remain. Please confirm the extent of demolition on this porch is to match the A-108 drawing.	Updated for Addendum B.
25	WT	N/A	AD-108 & H108	Air intake openings located at the East porch on drawing A-108 are not the same size and location as shown on drawing H108. Please clarify the size and location of air openings in these locations.	BVH to provide required clear area so PW can provide appropriately sized opening.
26	WT	077200	A-110	Specification Section 077200 specifies a safety rail system be provided with the new roof hatch. Drawing A-110 identifies a "Garlock Roof Edge - Portable Rail Guard System" at the roof hatch. The items seem to overlap in purpose, therefore please confirm both rails should be provided.	These systems are not redundant, both are required.
27	WT	N/A	A-100 thru A-506	Please identify the counter materials for counters in the following locations: B4006A, B4006B, B4005A, B4005B, B6005A, B7004B, and B7006B.	All counters referenced in this RFI should be stainless steel.
28	WT	N/A	A-100 thru A-107	Please identify the sink type for the sink located in room B1005B, B3005B, B4005A (two downdraft sinks), B4007A, B4007B, B5005B, B6005B, B7006A, and B7006B.	PW to provide in future addenda
29	WT	079500	A-201 thru A-204	Please specify the expansion joint cover show for replacement at the floor connection to L Building.	PW to provide in future addenda
30	WT	096723	N/A	Please confirm URF flooring does not apply to this project as all flooring is shown as ERF, however URF is included in the specifications.	All flooring in this project is ERF
31	WT	087100	N/A	Please confirm UCHC will provide all final cores and keys for this project and specification notes regarding keying/cores should be disregarded.	UCHC security to provide cores and keys
END OF 7/26/13 RFI SUBMISSION					

SECTION 23 72 00 - AIR-TO-AIR ENERGY RECOVERY EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Heat-pipe heat exchangers.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design ~~vibration isolation~~mounting and seismic-restraint details, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated include: rated capacities; operating characteristics; furnished specialties; and accessories.

B. LEED Submittals:

1. Product Data for Credit EA 4: Documentation indicating that equipment and refrigerants comply.
2. Product Data for Prerequisite IEQ 1: Documentation indicating that units comply with ASHRAE 62.1, Section 5 - "Systems and Equipment."

C. Shop Drawings: For air-to-air energy recovery equipment: Include plans; elevations; sections; details; and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
~~2. Wiring Diagrams: For power, signal, and control wiring.~~

D. Delegated-Design Submittal: For air-to-air energy recovery equipment indicated to comply with performance requirements and design criteria, including analysis data

signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of air-to-air energy recovery equipment.
~~2. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.~~
~~3.~~2. Design Calculations: Calculate requirements for selecting ~~vibration isolators and~~ seismic restraints ~~and for designing vibration isolation bases~~.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, elevations, and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:

~~1. Suspended ceiling components.~~
~~2.~~1. ~~Structural members~~Air handling unit to which equipment ~~or suspension systems~~ will be attached/installed.

B. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For air-to-air energy recovery equipment to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Filters: Filters to be provided by air handling unit manufacturer. See specification section 237314 Custom Central Station Field Erected Air Handling Units.

1.8 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ARI Compliance:

1. Capacity ratings for air-to-air energy recovery equipment shall comply with ARI 1060, "Performance Rating of Air-to-Air Heat Exchangers for Energy Recovery Ventilation Equipment."
2. Capacity ratings for air coils shall comply with ARI 410, "Forced-Circulation Air- Cooling and Air-Heating Coils."

C. ASHRAE Compliance:

1. Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."
2. Capacity ratings for air-to-air energy recovery equipment shall comply with ASHRAE 84, "Method of Testing Air-to-Air Heat Exchangers."

D. Qualified experience: The Heat Pipe supplier shall have a minimum of 5 years of experience designing, manufacturing, and installing Heat Pipes specifically for energy recovery applications

1.9 COORDINATION

A. Coordinate layout and installation of air-to-air energy recovery equipment ~~and suspension system~~ with ~~other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies~~air handling unit manufacturer.

~~B. Coordinate sizes and locations of concrete bases with actual equipment provided.~~

~~C. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.~~

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of air-to-air energy recovery equipment that fail in materials or workmanship within specified warranty period.

1. Warranty Period for Heat Pipe: 5 years.

PART 2 - PRODUCTS

2.1 HEAT-PIPE HEAT EXCHANGERS

A. Basis-of-Design Product: The Heat Pipe supplier shall also be the manufacturer of the heat pipe system. Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Des Champs Technologies.
2. Heat Pipe Technology, Inc.
3. Innergy Tech, Inc.

B. Casing: Stainless-steel flanged casing, with double wall partition and 4" polyurethane foam filled gap between airstreams.

C. Refrigerant: ASHRAE 34, Group A1.

D. Tubes: 1/2-inch diameter, copper

E. Fins: Aluminum sine wave

1. Fin Spacing: 0.067 inch
2. Fin and Tube Joint: Mechanical bond

F. Coating: Electrofin statically applied epoxy; apply to supply and exhaust.

G. Bypass Control: ~~Integral plenum containing heat pipe coil and gasketed~~Gasketed, ~~face and bypass,~~ opposed-blade bypass damper ~~. Dampers to be~~ provided by Air Handling Unit Manufacturer and meet damper specification in Division 23 Section "Custom Central-Station Air-Handling Units." Control per Division 23 Section "Instrumentation and Control for HVAC" and ATC control drawings.

H. Tilt Control: Stationary non-tilting type. Heat pipes requiring mechanical tilt mechanisms of any kind will not be accepted.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine casing insulation materials and filter media before air-to-air energy recovery equipment installation. Reject insulation materials and filter media that are wet, moisture damaged, or mold damaged.

C. Examine roughing-in for electrical services to verify actual locations of connections before installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install heat-pipe heat exchangers so supply and exhaust airstreams flow in the same (parallel) direction as shown on drawings.

1. Install heat exchanger with clearance space for heat-pipe coil removal.
2. Install duct access doors in both supply and exhaust ducts, both upstream and downstream, for access to both sides of heat-pipe coil. Access doors and panels are specified in Division 23 Section 237314 Custom Central Station Air Handling Units.

B. Install seismic restraints according to manufacturers' written instructions.

C. Install units with clearances for service and maintenance.

D. Install new filters at completion of equipment installation and before testing, adjusting, and balancing.

E. Pipe drains from drain pans to nearest floor drain; use ASTM B 88, Type L, drawn-temper copper water tubing with soldered joints, same size as condensate drain connection.

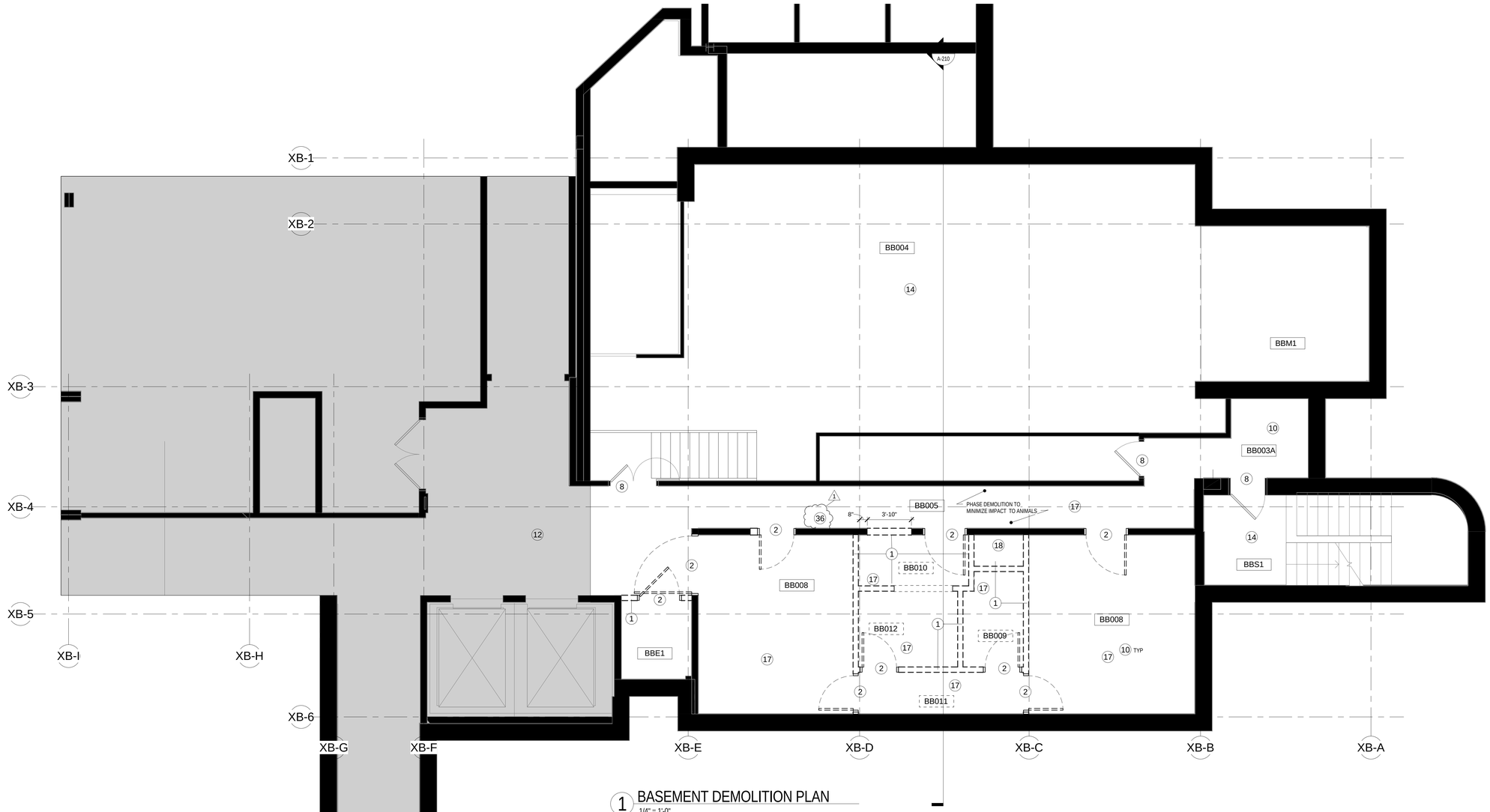
3.3 CONNECTIONS

~~A. Comply with requirements for piping specified in Division 23 Section "Hydronic Piping." Drawings indicate general arrangement of piping, fittings, and specialties.~~

~~B.~~A. Connect cooling condensate drain pans with air seal trap at connection to drain pan and install cleanouts at changes in pipe direction.

~~C. Comply with requirements for ductwork specified in Division 23 Section "Metal Ducts."~~

END OF SECTION
~~07/17/13~~08/16/13 – Addendum B



1 BASEMENT DEMOLITION PLAN

1/4" = 1'-0"

GENERAL DEMO NOTES

1. GENERAL CONTRACTOR TO COORDINATE ALL DEMOLITION WORK, AND NEW WORK SHOWN ON DRAWINGS, WITH ALL ASSOCIATED TRADES AND SUBCONTRACTORS.

2. ALL DEBRIS AND MATERIAL TO BE REMOVED FROM CONSTRUCTION AREA WILL BE DONE SO IN COVERED CONTAINERS. GENERAL CONTRACTOR TO COORDINATE REMOVAL ROUTE WITH THE OWNER AND AS SPECIFIED.

3. WHERE APPLICABLE, ENSURE ALL STRUCTURAL PROVISIONS WALLS, PINNING, SHORING, AND FORMING IS IN PLACE PRIOR TO COMMENCING WORK RELATED TO LOAD-BEARING STRUCTURE TO THE SATISFACTION OF THE CONSULTANTS.

4. REFER TO MEP DRAWINGS FOR ADDITIONAL DEMOLITION NOTES.

5. ALL EXISTING WALL GUARDS TO BE REMOVED.

6. LIMITED AREA OF CEILING DEMOLITION ON GROUND AND MAIN FLOORS FOR RELATED MECHANICAL WORK.

7. ALL EXISTING VAC, GAS AND OTHER SERVICE PIPING TO BE DISCONNECTED AND REMOVED. ALL EXISTING CUPSINKS IN HOLDING ROOMS TO BE REMOVED. SEE MEP DRAWINGS FOR MORE INFO.

8.NOT USED

9. WHERE NEW FLOORING IS SHOWN, ALL EXISTING CURBS TO BE REMOVED.

10. WORK RELATED TO OTHER TRADES MAY EXTEND BEYOND THE SCOPE SHOWN ON ARCHITECTURAL DRAWINGS. SEE SCOPE OF WORK FOR EACH TRADE ON THEIR RESPECTIVE DRAWINGS. MAINTAIN ALL FIRE RATINGS. MAINTAIN ALL ACCESS AND EXIT PATHWAYS DURING CONSTRUCTION. INFORM OWNER OF ANY UNEXPECTED CONDITIONS IMMEDIATELY.

11. ALL AREAS OUTSIDE THE SCOPE OF WORK SHOULD BE OPERATIONAL DURING CONSTRUCTION.

PARTITION LEGEND

- EXISTING WALL TO REMAIN
- DEMOLISHED WALL
- N.I.C.

DEMO NOTES & SYMBOLS

1. REMOVE EXISTING WALL CONSTRUCTION.
2. DEMOLISH EXISTING DOOR AND FRAME. SALVAGE EXISTING HARDWARE FOR REUSE
3. REMOVE EXISTING PLASTIC VISION PANEL IN DOORS TO REMAIN
4. REMOVE EXISTING WALL HUNG SINKS (REFER TO MEP DEMO NOTES).
5. REMOVE EXISTING SINK AND COUNTER.
6. SALVAGE EXISTING TABLE, CABINETS, & SHELVING; RETURN TO OWNER.
7. SALVAGE TV & MOUNTING BRACKETS; RETURN TO OWNER
8. EXISTING DOOR TO REMAIN. PROTECT AS REQUIRED
9. EXISTING ELEVATOR DOORS & CAB TO REMAIN, PROTECT AS REQUIRED.
10. REMOVE EXISTING CEILING
11. NOT USED
12. REFER TO NOTE 17
13. REMOVE WALL HUNG PRESSURE REDUCING STATION (COORDINATE W/ MEP DEMO NOTES)
14. NOT USED
15. REMOVE EXISTING BUILT-IN AND FREE STANDING CASEWORK.
16. DECOMMISSION, AND SALVAGE EXISTING BIO SAFETY CABINETS. TO BE RELOCATED IN NEW CONSTRUCTION, COORDINATE WITH ARCHITECTURAL DWGS.
17. REMOVE EXISTING FLOOR FINISH TO CONCRETE
18. NOT USED
19. REMOVE EXISTING FLOOR DRAIN.
20. REMOVE EXISTING PENTHOUSE STAIR & LANDING.
21. EXISTING GYP. SOFFIT @ WINDOWS TO REMAIN.
22. EXISTING FIN TUBE ENCLOSURE TO REMAIN. PROTECT DURING CONSTRUCTION. SEE MEP DRAWINGS FOR MORE INFO.
23. REMOVE PORTIONS OF WALL FOR ANY NEW DUCT PENETRATIONS.
24. SALVAGE EXISTING ROOF WALK.
25. REMOVE EXISTING ROOF HATCH
26. REMOVE EXISTING ROOF VENT. SEE DETAILS FOR MORE INFO.
27. REMOVE EXISTING EQUIPMENT CURB.
28. REMOVE EXISTING ROOF BALLAST.
29. REMOVE EXISTING BOILER FLUE AND CURB.
30. EXISTING ROOFING MEMBRANE TO REMAIN. PROTECT DURING CONSTRUCTION. SEE ROOF DETAILS FOR MORE INFO.
31. REMOVE EXISTING ROOFING MEMBRANE & ASSOCIATED FLASHING.
32. DEMO EXISTING FLOORING FOR ALL WORK ASSOCIATED WITH NEW PLUMBING SCOPE IN THIS AREA. SEE MEP DRAWINGS FOR EXTENT OF DEMOLITION. SALVAGE EXISTING DOOR, FRAME AND HARDWARE FOR REUSE.
33. REMOVE EXISTING SOFFIT IN ITS ENTIRETY.
34. DEMOLISH HOT FLOOR, REMOVE CONCRETE AND SLOP SINK
35. DEMOLISH EXISTING WALL PROTECTION TYPICAL ALL WALLS, ALL FLOORS
36. REMOVE ALL EXISTING AUTOCLAVES IN THIS SPACE. RETURN TO OWNER. REFER TO MEP DRAWINGS.

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ADDENDUM B

NO	ISSUE	DATE
1	ADDENDUM B	08/16/13

Sheet Information	
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Checked	MK
Approved	TG

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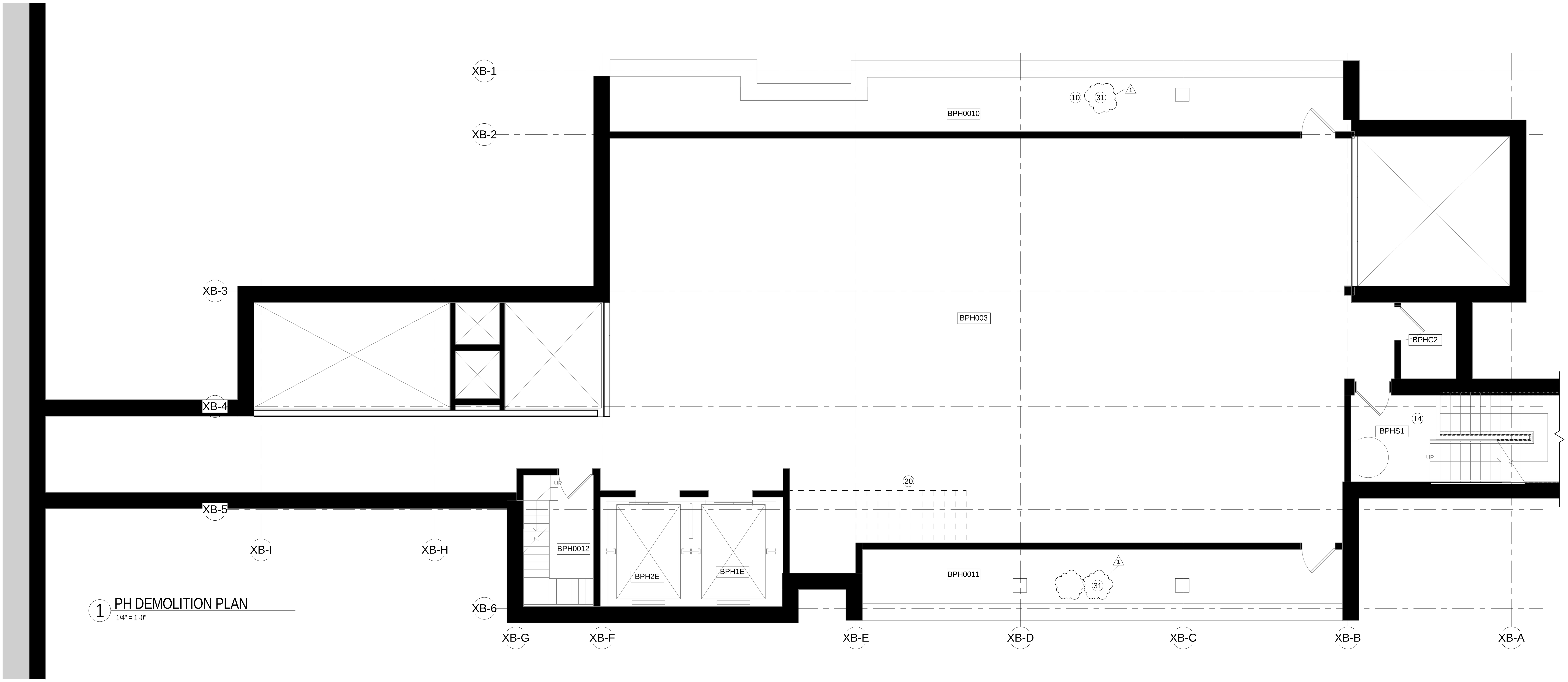
Basement Demolition Plan

Sheet
AD-100

NORTH



1 PH DEMOLITION PLAN
1/4" = 1'-0"

GENERAL DEMO NOTES

1. GENERAL CONTRACTOR TO COORDINATE ALL DEMOLITION WORK, AND NEW WORK SHOWN ON DRAWINGS, WITH ALL ASSOCIATED TRADES AND SUBCONTRACTORS.

2. ALL DEBRIS AND MATERIAL TO BE REMOVED FROM CONSTRUCTION AREA WILL BE DONE SO IN COVERED CONTAINERS. GENERAL CONTRACTOR TO COORDINATE REMOVAL ROUTE WITH THE OWNER AND AS SPECIFIED.

3. WHERE APPLICABLE, ENSURE ALL STRUCTURAL PROVISIONS WALLS, PINNING, SHORING, AND FORMING IS IN PLACE PRIOR TO COMMENCING WORK RELATED TO LOAD-BEARING STRUCTURE TO THE SATISFACTION OF THE CONSULTANTS.

4. REFER TO MEP DRAWINGS FOR ADDITIONAL DEMOLITION NOTES.

5. ALL EXISTING WALL GUARDS TO BE REMOVED.

6. LIMITED AREA OF CEILING DEMOLITION ON GROUND AND MAIN FLOORS FOR RELATED MECHANICAL WORK.

7. ALL EXISTING VAC, GAS AND OTHER SERVICE PIPING TO BE DISCONNECTED AND REMOVED. ALL EXISTING CUPSINKS IN HOLDING ROOMS TO BE REMOVED. SEE MEP DRAWINGS FOR MORE INFO.

8.NOT USED

9. WHERE NEW FLOORING IS SHOWN, ALL EXISTING CURBS TO BE REMOVED.

10. WORK RELATED TO OTHER TRADES MAY EXTEND BEYOND THE SCOPE SHOWN ON ARCHITECTURAL DRAWINGS. SEE SCOPE OF WORK FOR EACH TRADE ON THEIR RESPECTIVE DRAWINGS. MAINTAIN ALL FIRE RATINGS. MAINTAIN ALL ACCESS AND EXIT PATHWAYS DURING CONSTRUCTION. INFORM OWNER OF ANY UNEXPECTED CONDITIONS IMMEDIATELY.

11. ALL AREAS OUTSIDE THE SCOPE OF WORK SHOULD BE OPERATIONAL DURING CONSTRUCTION.

PARTITION LEGEND

- EXISTING WALL TO REMAIN
- DEMOLISHED WALL
- N.I.C.

DEMO NOTES & SYMBOLS

(1) REMOVE EXISTING WALL CONSTRUCTION.
(2) DEMOLISH EXISTING DOOR AND FRAME. SALVAGE EXISTING HARDWARE FOR REUSE
(3) REMOVE EXISTING PLASTIC VISION PANEL IN DOORS TO REMAIN
(4) REMOVE EXISTING WALL HUNG SINKS (REFER TO MEP DEMO NOTES).
(5) REMOVE EXISTING SINK AND COUNTER.
(6) SALVAGE EXISTING TABLE, CABINETS, & SHELVING; RETURN TO OWNER.
(7) SALVAGE TV & MOUNTING BRACKETS; RETURN TO OWNER
(8) EXISTING DOOR TO REMAIN. PROTECT AS REQUIRED
(9) EXISTING ELEVATOR DOORS & CAB TO REMAIN, PROTECT AS REQUIRED.
(10) REMOVE EXISTING CEILING
(11) NOT USED
(12) REFER TO NOTE 17
(13) REMOVE WALL HUNG PRESSURE REDUCING STATION (COORDINATE W/ MEP DEMO NOTES)
(14) NOT USED
(15) REMOVE EXISTING BUILT-IN AND FREE STANDING CASEWORK.
(16) DECOMMISSION, AND SALVAGE EXISTING BIO SAFETY CABINETS. TO BE RELOCATED IN NEW CONSTRUCTION, COORDINATE WITH ARCHITECTURAL DWGS.
(17) REMOVE EXISTING FLOOR FINISH TO CONCRETE
(18) NOT USED
(19) REMOVE EXISTING FLOOR DRAIN.
(20) REMOVE EXISTING PENTHOUSE STAIR & LANDING.
(21) EXISTING GYP. SOFFIT @ WINDOWS TO REMAIN.
(22) EXISTING FIN TUBE ENCLOSURE TO REMAIN. PROTECT DURING CONSTRUCTION. SEE MEP DRAWINGS FOR MORE INFO.
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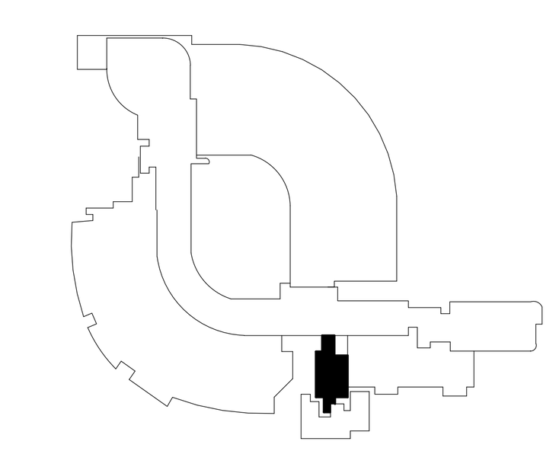
ADDENDUM
B



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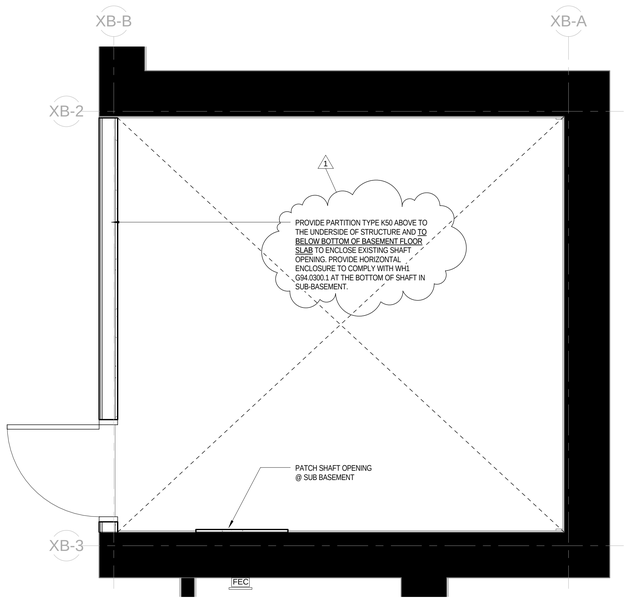
Penthouse Demolition Plan

Sheet

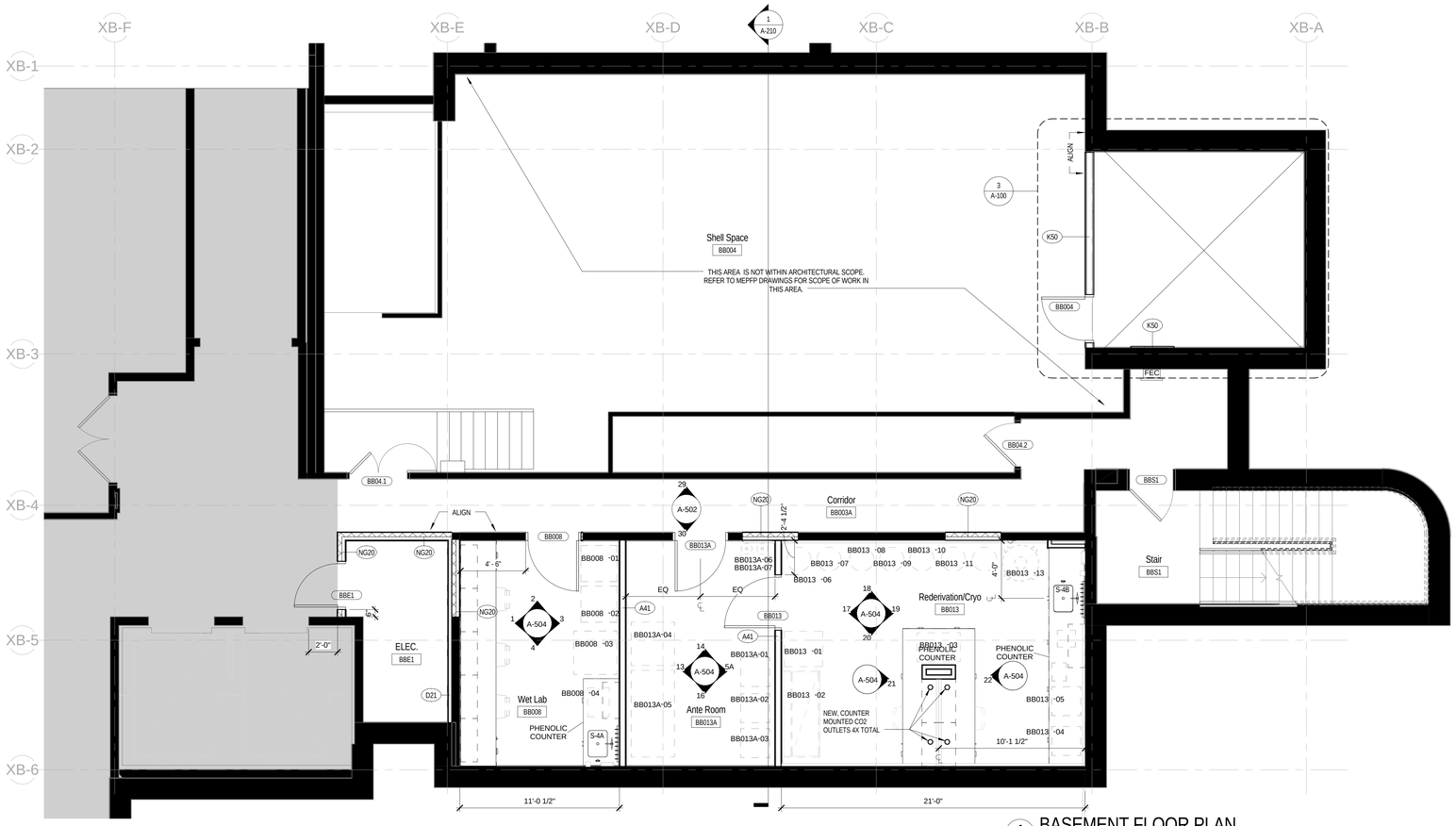
NORTH

AD-108



3 ENLARGED PLAN @ SUB-BASEMENT SHAFT

1/2" = 1'-0"



1 BASEMENT FLOOR PLAN

1/4" = 1'-0"

NOTES

1. NEW CONCRETE MASONRY WALLS TO MATCH THE EXISTING CONCRETE MASONRY WALLS.

2. FIELD MEASURE AND CONFIRM DIMENSIONS FOR OWNER PROVIDED EQUIPMENT AND FURNISHINGS.

3. SCOPE OF WORK ON GROUND AND MAIN FLOORS IS MEPFP ONLY. REFER TO MEPFP DRAWINGS FOR ADDITIONAL INFORMATION. PATCH ALL AREAS AFFECTED BY MEPFP TO MATCH EXISTING ONCE MEPFP WORK IS COMPLETE

4. FILL EXISTING TRENCH. LEVEL TO EXISTING FLOOR WHERE NOTED ON PLAN. SEE SMEP DRAWINGS FOR MORE INFO.

5. ALL NEW FURRED WALLS TO BE D-32 U.N.O.

6. ALL OPERATIONS IN AREAS OUTSIDE THE CONSTRUCTION AREA SHOULD BE MAINTAINED DURING CONSTRUCTION.

7. COORDINATE ALL WORK IN BASEMENT LEVEL WITH THE CAGEWASH AREA.

8. NOT USED

9. WORK RELATED TO OTHER TRADES MAY EXTEND BEYOND THE SCOPE SHOWN ON ARCHITECTURAL DRAWINGS. SEE SCOPE OF WORK FOR EACH TRADE ON THEIR RESPECTIVE DRAWINGS. SOME PATCHING AND REPAIR MAY BE REQUIRED OUTSIDE OF THE SCOPE SHOWN ON ARCHITECTURAL DRAWINGS. PATCH AND REPAIR WORK TO MATCH EXISTING FINISHES AND MATERIALS. MAINTAIN ALL FIRE RATINGS. MAINTAIN ALL ACCESS AND EXIT PATHWAYS DURING CONSTRUCTION. INFORM OWNER OF ANY UNEXPECTED CONDITIONS IMMEDIATELY.

10. ALL SHAFT, PARTITION & FLOOR PENETRATIONS CREATED BY DEMO CONTRACTOR & NOT UTILIZED BY ANY OTHER TRADES TO BE PATCHED TO MATCH EXISTING.

LEGEND

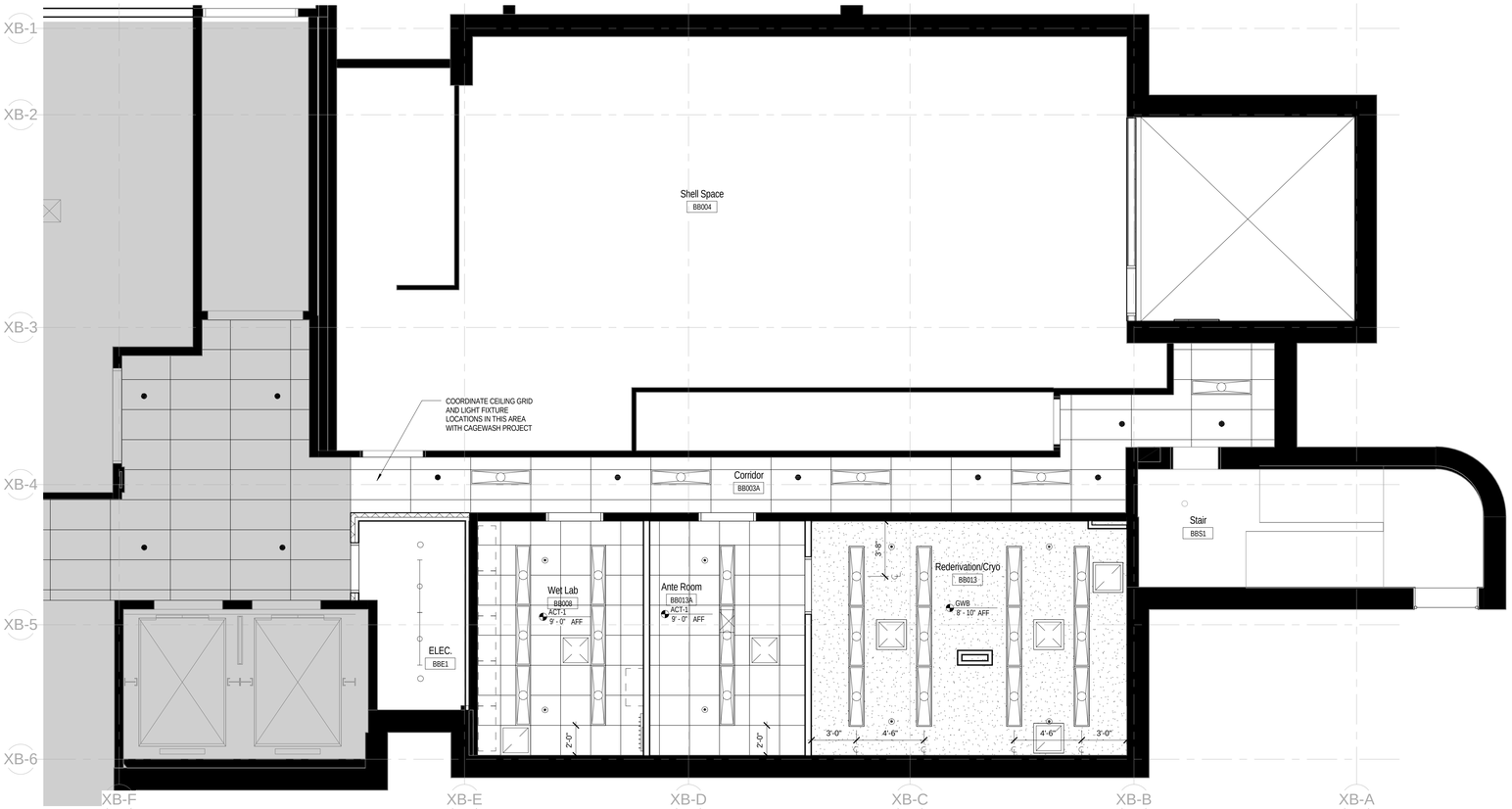
- EXISTING WALL TO REMAIN
- NEW 5/8" GWB ON MTL STUDS (FLOOR TO UNDERSIDE OF SLAB) UNLESS NOTED OTHERWISE
- NEW GLAZED BLOCK TILE WALL WITH GWB ON STUDS ON ONE SIDE TO MATCH AND ALIGN W/ ADJACENT & EXISTING WALL TO REMAIN
- EXISTING DOOR TO REMAIN
- NEW DOOR

RCP LEGEND

- ACT - CEILING TILES SIM. TO USG CLIMA PLUS CLASS 100. SEE SPECS.
- GYP - SEE SPECS.
- 4"Ø EXHUST
- PHOTOSENSOR - SEE MEP
- SPRINKLER HEAD - SEE MEP
- SPRINKLER HEAD - SEE MEP
- 24"x24" RECESSED LIGHT FIXTURE
- 12"x48" RECESSED LIGHT FIXTURE
- DOWN LIGHT WITH RED LAMP - SEE MEP
- 24"x24" RETURN DIFFUSER
- 24"x24" SUPPLY DIFFUSER

RCP NOTES

1. CENTER LIGHTS, SPRINKLERS, EQUIPMENT IN CEILING TILE PER ARCHITECTURAL DRAWINGS UNLESS OTHERWISE NOTED.
2. COORDINATE WITH MEP & FIRE PROTECTION DRAWINGS.
3. ALL CEILING GRIDS TO BE INSTALLED AS SHOWN ON ARCHITECTURAL DRAWNGS. COORDINATE WITH ARCHITECT WHERE FIELD CONDITIONS DIFFER FROM DRAWINGS.
4. SEE FINISH SCHEDULE FOR CEILING TYPES.
5. REFER TO ELECTRICAL DRAWINGS FOR FIXTURE TYPES AND LAYOUTS IN PENTHOUSE AREA.
6. REFER TO A-101 FOR TYPICAL HOLDING ROOM RCP LAYOUT.
7. SPRINKLER HEADS TO BE IN THE CENTER OF ACT, TYP. SEE PLAN FOR GYP. LOCATIONS.
8. ALL NEW ACT TO BE ACT-2 UNLESS NOTED OTHERWISE. REFER TO SPECIFICATIONS



2 BASEMENT REFLECTED CEILING PLAN

1/4" = 1'-0"

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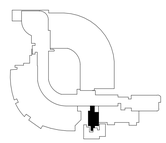

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Basement Floor Plan & Reflected Ceiling Plan

Sheet

A-100

NOTES

1. NEW CONCRETE MASONRY WALLS TO MATCH THE EXISTING CONCRETE MASONRY WALLS.

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5. ALL NEW FURRED WALLS TO BE D-32 U.N.O.

6. ALL OPERATIONS IN AREAS OUTSIDE THE CONSTRUCTION AREA SHOULD BE MAINTAINED DURING CONSTRUCTION.

7. COORDINATE ALL WORK IN BASEMENT LEVEL WITH THE CAGEWASH AREA.

8. NOT USED

9. WORK RELATED TO OTHER TRADES MAY EXTEND BEYOND THE SCOPE SHOWN ON ARCHITECTURAL DRAWINGS. SEE SCOPE OF WORK FOR EACH TRADE ON THEIR RESPECTIVE DRAWINGS. SOME PATCHING AND REPAIR MAY BE REQUIRED OUTSIDE OF THE SCOPE SHOWN ON ARCHITECTURAL DRAWINGS. PATCH AND REPAIR WORK TO MATCH EXISTING FINISHES AND MATERIALS. MAINTAIN ALL FIRE RATINGS. MAINTAIN ALL ACCESS AND EXIT PATHWAYS DURING CONSTRUCTION. INFORM OWNER OF ANY UNEXPECTED CONDITIONS IMMEDIATELY.

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LEGEND

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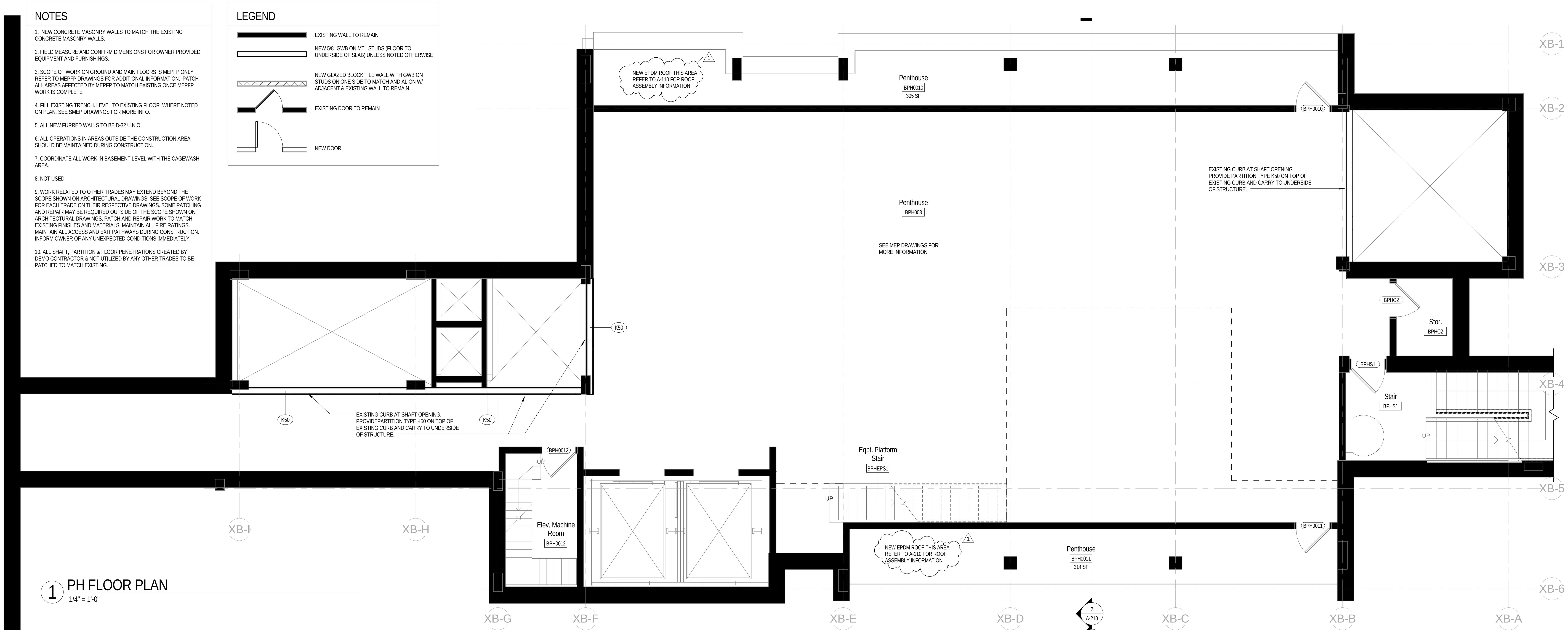
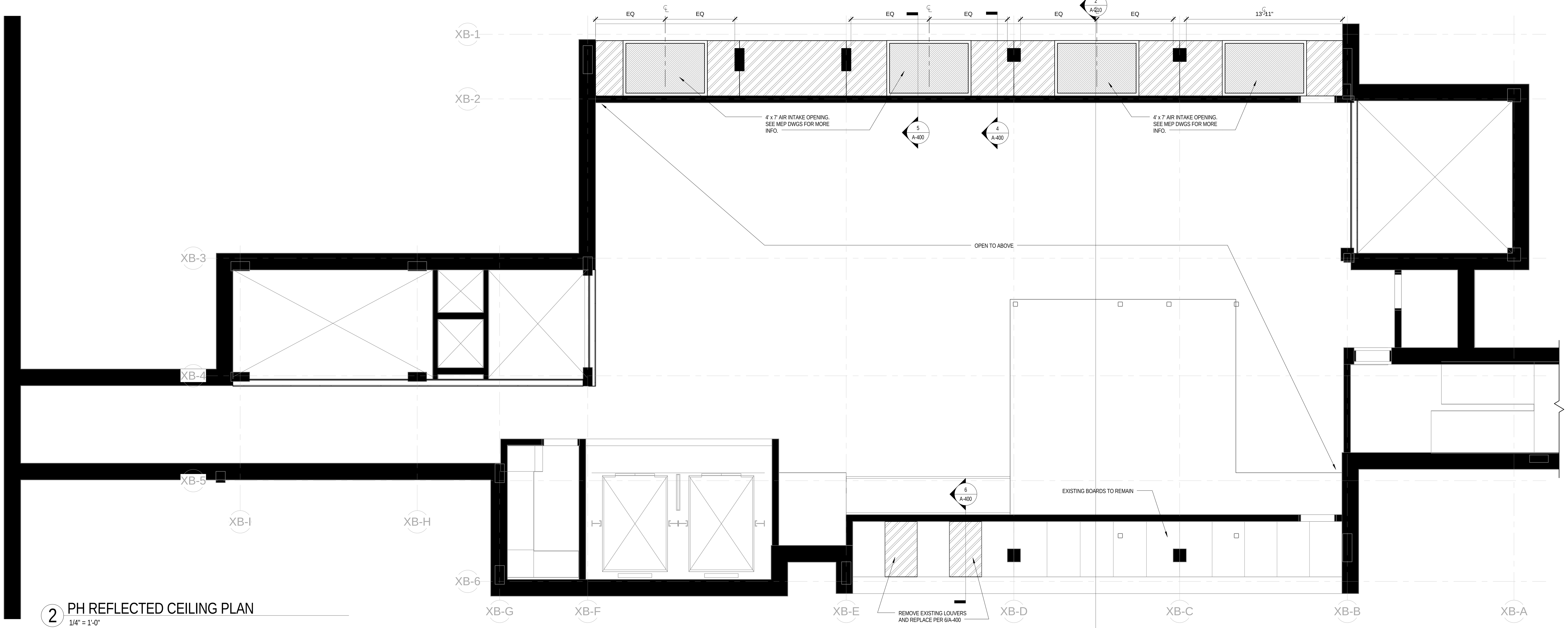
- NEW 5/8" GWB ON MTL STUDS (FLOOR TO UNDERSIDE OF SLAB) UNLESS NOTED OTHERWISE
- NEW GLAZED BLOCK TILE WALL WITH GWB ON STUDS ON ONE SIDE TO MATCH AND ALIGN W/ ADJACENT & EXISTING WALL TO REMAIN
- EXISTING DOOR TO REMAIN
- NEW DOOR



1 PH FLOOR PLAN
1/4" = 1'-0"



2 PH REFLECTED CEILING PLAN
1/4" = 1'-0"

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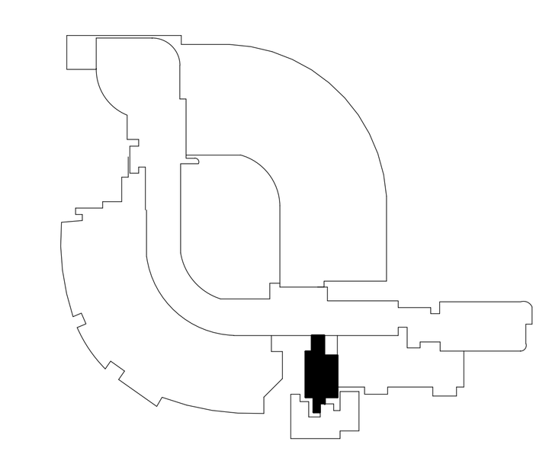

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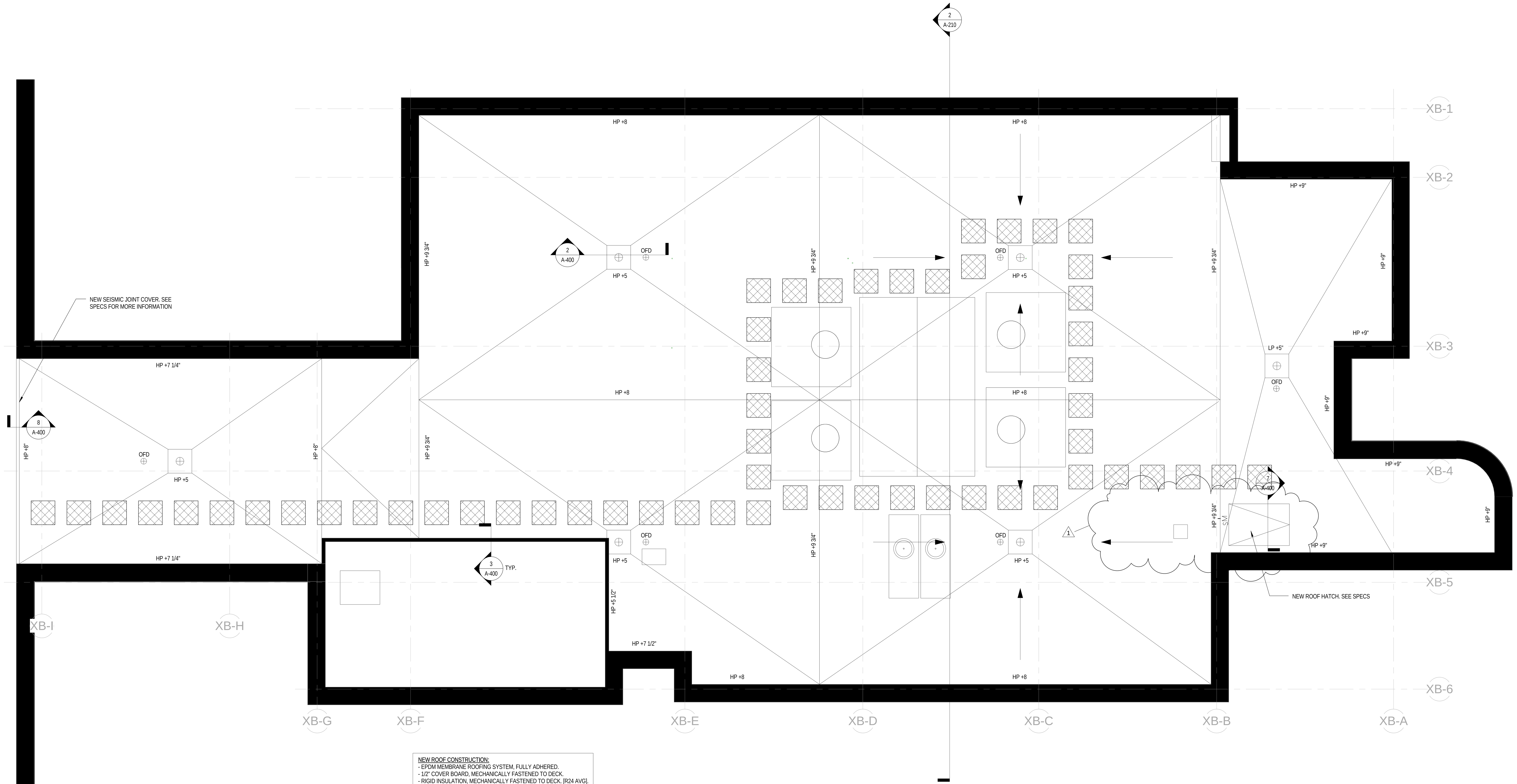
PH Floor Plan & Reflected Ceiling Plan

NORTH

Sheet

A-108



1 ROOF PLAN

1/4" = 1'-0"

NEW ROOF CONSTRUCTION:
- EPDM MEMBRANE ROOFING SYSTEM, FULLY ADHERED.
- 1/2" COVER BOARD, MECHANICALLY FASTENED TO DECK.
- RIGID INSULATION, MECHANICALLY FASTENED TO DECK. [R24 AVG].
- APPLIED VAPOR BARRIER MEMBRANE
- 1 1/2"X18 GA. METAL ROOF DECK.

SEE SPECS FOR MORE INFORMATON

NOTES

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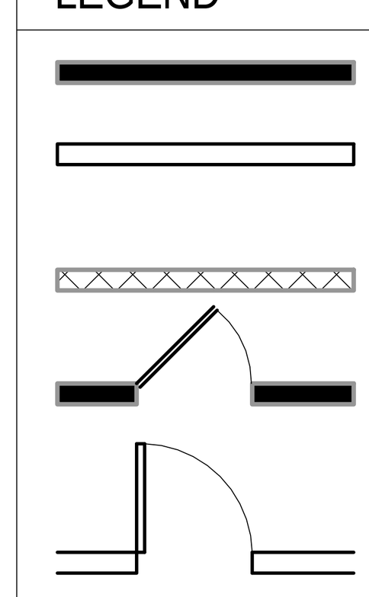

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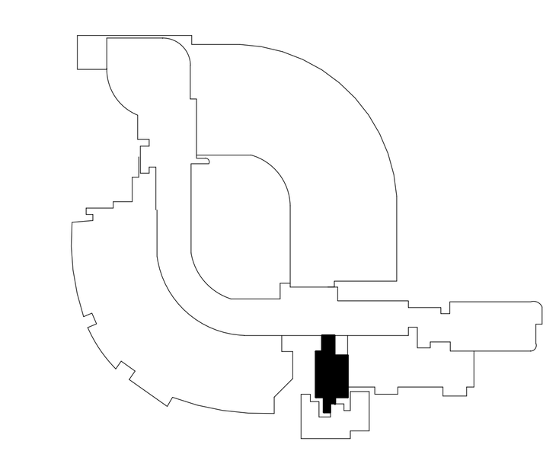

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Roof Plan

Sheet

NORTH

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DOOR SCHEDULE

DOOR TAG	LOCATION FROM	LOCATION TO	OPENING SIZE WIDTH	OPENING SIZE HEIGHT	DOOR TYPE	DOOR MTL.	DOOR FINISH	DOOR GLAZING	DOOR LOUVER	FRAME TYPE	FRAME MTL.	FRAME FINISH	FRAME HEAD	FRAME JAMB	FRAME SILL	HARDWARE	FIRE RATING	REMARKS
BASEMENT FLOOR LEVEL																		
BB004		Shell Space	3' - 0"	7' - 0"	F	HM	PTD	NO	NO	F1	HM	PTD	1/A-801	2/A-801	N/A	7	90 MINS	
BB04.1	Corridor	Shell Space	4' - 0"	7' - 10"	FF											5		Existing - Refinish to Match New
BB04.2	Shell Space	Corridor	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
BB008	Corridor	Wet Lab	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	1		
BB013	Rederivation/Cryo	Ante Room	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	1		
BB013A	Corridor	Ante Room	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	1		
BBE1	ELEC.		3' - 0"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	3		
BBS1	Corridor	Stair	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
FIRST FLOOR LEVEL																		
B1E1	ELEC. -1	Elev. Lobby	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
B1S1	Corridor	Stair	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
B1001		Corridor	6' - 0"	7' - 0"	FF											5		Existing - Refinish to Match New
B1002	Write Up	Elev. Lobby	6' - 0"	7' - 10"	FNV2	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	6		
B1004A	Write Up	Storage-1	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	4		
B1004B	Elev. Lobby	Storage-1	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	4		
B1005	Procedure-1	Write Up	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B1005B	Write Up	Procedure-2	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B1006	Corridor	Mouse Holding-1	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B1007	Corridor	Mouse Holding-2	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B1008	Corridor	Mouse Holding-3	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B1009	Corridor	Mouse Holding-4	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B1010	Corridor	Mouse Holding-5	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B1011	Corridor	Mouse Holding-6	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B1012	Elev. Lobby	Janitor-1	3' - 0"	7' - 10"	F											9		Existing - Refinish to Match New
SECOND FLOOR LEVEL																		
B2E1	Elev. Lobby	ELEC. - 2	3' - 0"	7' - 10"	F											5		Existing Door with New Glazing - Refinish to Match New
B2S1	Corridor	Stair	3' - 0"	7' - 10"	F											5		Existing Door with New Glazing - Refinish to Match New
B2001		Corridor	6' - 0"	7' - 0"	FF											5		Existing - Refinish to Match New
B2002	Write Up	Elev. Lobby	6' - 0"	7' - 10"	FNV2	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	6		
B2004A	Write Up	Storage-2	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	4		
B2004B	Elev. Lobby	Storage-2	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	4		
B2005A	Write Up	Necropsy	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B2006	Corridor	Large Animal Holding - Primate	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B2007	Corridor	Large Animal Holding-1	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B2008	Corridor	Large Animal Holding-2	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B2009	Corridor	Large Animal Holding-3	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B2010	Corridor	Large Animal Holding-4	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B2011	Corridor	Large Animal Holding-5	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B2012	Elev. Lobby	Janitor-2	3' - 0"	7' - 10"	F											9		Existing Door with New Glazing - Refinish to Match New
THIRD FLOOR LEVEL																		
B3E1	ELEC. - 3	Lobby	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
B3S1	Corridor	Stair	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
B3001		Corridor	6' - 0"	7' - 0"	FF											5		Existing - Refinish to Match New
B3002	Write Up	Lobby	6' - 0"	7' - 10"	FNV2	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	6		
B3004A	Write Up	Storage-3	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	4		
B3004B	Lobby	Storage-3	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	4		
B3005A	Procedure-3	Write Up	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B3005B	Write Up	Procedure-4	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B3006	Corridor	Mouse Holding-7	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B3007	Corridor	Mouse Holding-8	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B3008	Corridor	Mouse Holding-9	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B3009	Corridor	Mouse Holding-10	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B3010	Corridor	Mouse Holding-11	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B3011	Corridor	Mouse Holding-12	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B3016	Lobby	Janitor-3	3' - 0"	7' - 10"	F											9		Existing - Refinish to Match New
FOURTH FLOOR LEVEL																		
B4E1	ELEC. - 4	Elev. Lobby	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
B4S1	Corridor	Stair	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
B4001		Corridor	6' - 0"	7' - 0"	FF											5		Existing - Refinish to Match New
B4002	Vestibule	Elev. Lobby	6' - 0"	7' - 10"	FNV2	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	6		
B4004A	Vestibule	Storage-4	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	4		
B4004B	Elev. Lobby	Storage-4	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	4		
B4005	Vestibule	Write Up	6' - 0"	7' - 10"	G2	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	8		
B4005A	Profusion Lab	Write Up	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B4005B	Write Up	Mouse Behavioral Procedure	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B4006A	Mouse Behavioral Procedure	Write Up	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	2		
B4006B	Write Up	Mouse Behavorial Procedure	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	2		
B4007A	Vestibule	Procedure	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B4007B	Vestibule	Procedure	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B4008	Corridor	Mouse Holding-13	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B4009	Corridor	Mouse Holding-14	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B4010	Corridor	Mouse Holding-15	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B4011	Corridor	Mouse Holding-16	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B4012	Elev. Lobby	Janitor-4	3' - 0"	7' - 10"	F											9		Existing - Refinish to Match New
FIFTH FLOOR LEVEL																		
B5E1	ELEC. - 5	Elev. Lobby	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
B5S1	Corridor	Stair	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
B5001		Corridor	6' - 0"	7' - 10"	FF											5		Existing - Refinish to Match New
B5002	Write Up	Elev. Lobby	6' - 0"	7' - 10"	FNV2	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	6		
B5004A	Write Up	Storag-5	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	4		
B5004B	Elev. Lobby	Storag-5	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	4		
B5005A	Write Up	Procedure-5	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B5005B	Write Up	Procedure-6	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B5006	Corridor	Mouse Holding-17	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B5006A	Mouse Holding-17	Carcinogen Holding	3' - 6"	7' - 10"	FNV	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	2		
B5007	Corridor	Mouse Holding-18	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B5008	Corridor	Carcinogen Holding	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B5009	Corridor	Mouse Holding-19	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B5010	Corridor	Aquatics Holding-1	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B5011	Corridor	Aquatics Holding-2	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B5012	Elev. Lobby	Janitor-5	3' - 0"	7' - 10"	F											9		Existing - Refinish to Match New
SIXTH FLOOR LEVEL																		
B6E1	ELEC. - 6	Elev. Lobby	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
B6S1	Corridor	Stair	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
B6001		Corridor	6' - 0"	7' - 10"	FF											5		Existing - Refinish to Match New
B6002	Write Up	Elev. Lobby	6' - 0"	7' - 10"	FNV2	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	6		
B6004A	Write Up	Storage-6	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	4		
B6004B	Elev. Lobby	Storage-6	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	4		
B6005A	Procedure-7	Write Up	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B6005B	Write Up	Procedure-8	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B6006	Ante Room	ABSL2 Holding-1	3' - 6"	7' - 10"	FNV	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	10		
B6007	Corridor	Mouse Holding-20	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B6008	Ante Room	Procedure	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B6008A	Corridor	Ante Room	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	2		
B6009	Corridor	Mouse Holding-21	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B6010	Ante Room	ABSL2 Holding-2	3' - 6"	7' - 10"	FNV	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	10		
B6011	Corridor	Mouse Holding-22	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B6012	Elev. Lobby	Janitors-6	3' - 0"	7' - 10"	F											9		Existing - Refinish to Match New
SEVENTH FLOOR LEVEL																		
B7E1	ELEC. - 7	Elev. Lobby	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
B7S1	Corridor	Stair	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
B704A	Storage-7	Elev. Lobby	3' - 6"	7' - 10"	F													
B7001		Corridor	6' - 0"	7' - 10"	FF											5		Existing - Refinish to Match New
B7003	VEST.	Corridor	6' - 0"	7' - 10"	FNV2	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	6		New Door in Existing Opening
B7004	VEST.	Storage-7	3' - 6"	7' - 10"	F	HM	PTD	NO	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	4		
B7004A	Seating	CT	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B7004C	VEST.	Seating	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	1		
B7006A	Corridor	Procedure	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	2		
B7006B.1	Seating	X-Ray	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	5/A-801	6/A-801	N/A	2		
B7006B.2	X-Ray	Procedure	3' - 6"	7' - 10"	G	HM	PTD	YES	NO	F1	HM	PTD	3/A-801	4/A-801	N/A	2		
B7007	Corridor	Mouse Holding-22	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B7008	Corridor	Mouse Holding-23	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B7009	Corridor	Mouse Holding-24	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B7010	Corridor	Mouse Holding-25	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B7011	Corridor	Mouse Holding-26	3' - 6"	7' - 10"	FNV											5		Existing Door with New Glazing - Refinish to Match New
B7012	Elev. Lobby	Janitor-7	3' - 0"	7' - 10"	F											9		Existing - Refinish to Match New
B7013	Corridor	Mouse Holding-22	3' - 6"	7' - 10"	FNV													
PENTHOUSE LEVEL																		
BPH0010	Penthouse	Penthouse	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
BPH0011	Penthouse	Penthouse	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
BPH0012	Penthouse	Elev. Machine Room	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
BPHC2	Penthouse	Stor.	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New
BPHS1	Penthouse	Stair	3' - 0"	7' - 10"	F											5		Existing - Refinish to Match New

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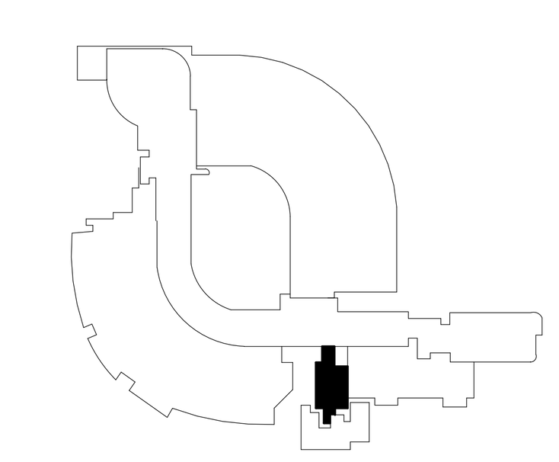
ADDENDUM B



NO	ISSUE	DATE
1	ADDENDUM B	08/16/13

Sheet Information	
Date	16 AUGUST 2013
Job Number	155064.000
Drawn	Author
Checked	MK
Approved	TG

Title

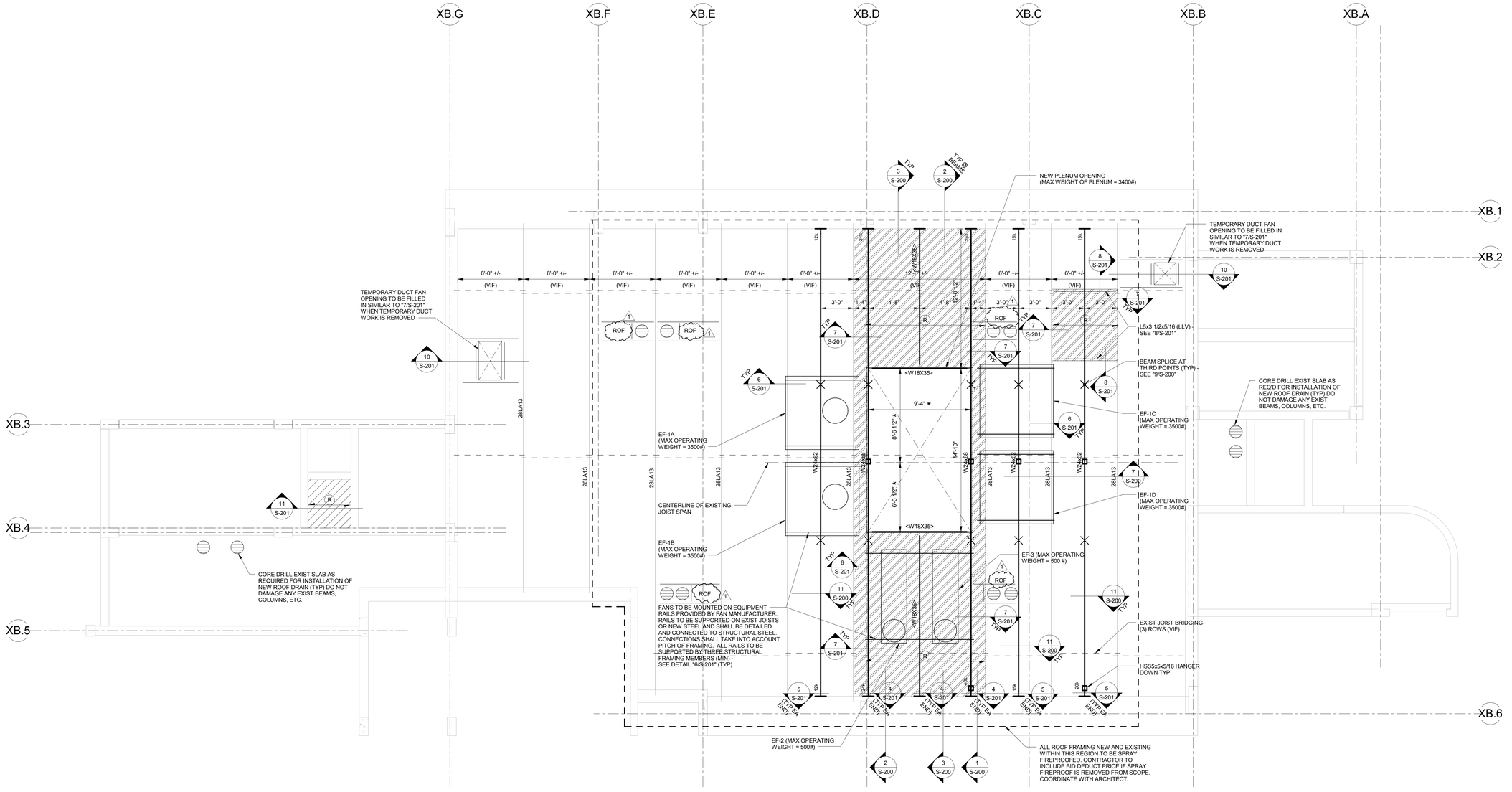
Door Schedule

Sheet

NORTH

A-800

0 1/2" 1" 2"



ROOF FRAMING PLAN
1/4" = 1'-0"

NOTES:

1. REFERENCE ELEVATION 0'-0" IS EQUIVALENT TO ACTUAL ELEVATION 426'-0".
2. TOP OF NEW STEEL TO MATCH EXISTING STEEL. CONTRACTOR TO COORDINATE ELEVATIONS AND ROOF PITCH OF EXISTING PRIOR TO DETAILING AND FABRICATION OF NEW STEEL.
3. (R) INDICATES DIRECTION OF SPAN 1 1/2" DEEP, 18 GAGE, WIDE RIB, GALVANIZED, METAL ROOF DECK. SEE SPECIFICATIONS.
4. CANT INDICATES CANTILEVERED BEAM TO BE THE SAME BEAM SIZE AS THE ADJACENTBACKSPAN.
5. ▶— INDICATES MOMENT CONNECTION TO DEVELOP FULL BENDING AND SHEAR CAPACITY OF BEAM OR GIRDER, UNLESS OTHERWISE NOTED.
6. ◎ INDICATES ROOF DRAIN OR OVERFLOW ROOF DRAIN. COORDINATE QUANTITY AND LOCATIONS WITH PLUMBING AND ARCHITECTURAL DRAWINGS.
7. ROF INDICATES ROOF OPENING FRAME. SEE TYPICAL DETAIL ON DRAWING "S-200".
8. BEAM END CONNECTIONS SHALL BE SELECTED AND DETAILED FOR 1.25 TIMES THE REACTIONS INDICATED ON PLAN. END CONNECTIONS ON BEAMS DESIGNATED <WXXxXX> SHALL BE SELECTED AND DETAILED FOR A MINIMUM OF 10 KIPS.
9. CONTRACTOR TO COORDINATE LOCATION AND DIMENSIONS OF MECHANICAL EQUIPMENT AND MECHANICAL EQUIPMENT SUPPORT FRAMING WITH MECHANICAL CONTRACTOR AND/OR EQUIPMENT SUPPLIER. STRUCTURE HAS BEEN DESIGNED TO SUPPORT THE EQUIPMENT INDICATED ON THE MECHANICAL DRAWINGS. IF CHANGES ARE MADE, NOTIFY THE STRUCTURAL ENGINEER IMMEDIATELY FOR SUPPORT VERIFICATION.
10. CONTRACTOR TO COORDINATE SIZE AND LOCATION OF ALL OPENINGS AND SLEEVES WITH ARCHITECTURAL DRAWINGS AND MEP CONTRACTORS.
11. CONTRACTOR PERFORMING STRUCTURAL WORK SHALL BE RESPONSIBLE FOR ALL SHORING OF EXISTING CONSTRUCTION REQUIRED TO SAFELY COMPLETE WORK.
12. ✕ INDICATES BEAM SPLICE LOCATION AT THIRD POINTS OF SPANS. SEE DETAIL "9/S-200" FOR TYPICAL SPLICE DETAIL.
13. ★ INDICATES STEEL FABRICATOR TO COORDINATE FINAL LCOATION OF FRAMING WITH MEP CONTRACTOR AND APPROVED EQUIPMENT SHOP DRAWINGS.
14. DO NOT SUPPORT UTILITIES FROM EXISTING PENTHOUSE ROOF SLAB OR METAL DECKALL HANGERS SHOULD BE SUPPORTED FROM STRUCTURAL STEEL. HANGERS MAY BECONNECTED TO TOP OR BOTTOM FLANGE OF STEEL BEAMS. HANGERS SHALL BE CONNECTED TO OPEN WEB JOISTS AT TOP CHORD OR BOTTOM CHORD PANEL POINTS ONLY UNLESS ANGLES INSTALLED PER DETAIL "10/S-200". MAXIMUM POINT LOAD PER PANEL POINT 125 POUNDS.

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ADDENDUM B

NO	ISSUE	DATE
1	ADDENDUM B	08/16/13

Sheet Information

Date	16 AUGUST 2013
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Drawn	JWM/SRP
Checked	JLF
Approved	KFF

Title

ROOF FRAMING PLAN

Sheet

S-110

AHU SCHEDULE GENERAL NOTES

1. MANUFACTURER BASED UPON: AIR ENTERPRISES
2. MAIN HEATING COIL CAPACITIES BASED UPON DESIGN HEATING CFM AND MINIMUM OUTDOOR AIR CFM, 3°F O.A. (WINTER), 71°F/40% RH R.A., WITHOUT HEAT RECOVERY APPLIED, 40% GLYCOL.
3. COOLING CAPACITIES BASED UPON DESIGN COOLING CFM AND MINIMUM OUTDOOR AIR CFM, 91°F DB/74°F WB O.A. (SUMMER) 72 DB/50% RH R.A. WITHOUT HEAT RECOVERY APPLIED.
4. TSP RATING INCLUDES A MID LIFE DIRTY FILTER ALLOWANCE OF 1.6" WC FOR MERY 8 PREFILTER FUTURE 4" PLEATED CARBON FILTER AND HIGH CAPACITY HEPA FINAL FILTER. (1)
5. ALL MOTORS SHALL BE PREMIUM EFFICIENCY TYPE PER SPECIFICATIONS.
6. MOTOR VOLTAGES TO BE 460V-3 PHASE FOR 1/2 HP AND LARGER AND 115V-1 PHASE FOR 1/3 HP AND SMALLER.
7. ALTERNATE MANUFACTURER OF EQUAL PERFORMANCE AND CAPACITY MUST HAVE SIMILAR PHYSICAL DIMENSIONS, OTHERWISE BASE MANUFACTURER MUST BE SUPPLIED. CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING DIMENSIONS IN FIELD.
8. PROVIDE VIBRATION ISOLATION & SEISMIC RESTRAINT PER VIBRATION ISOLATION SPECIFICATION.
9. ALL CONNECTIONS ARE TOP END OF UNIT UNLESS NOTED OTHERWISE. ALSO SEE PLANS. TRANSITION DUCTS TO UNIT CONNECTION SIZE.

AHU SCHEDULE NOTES

1. AHU SHALL BE FIELD WIRED BY DIVISION 26 UNDER SUPERVISION OF AHU MANUFACTURER FOR MULTIPLE POINT POWER CONNECTIONS, (1) PER FAN & (1) PER 120V LIGHT/RECEPTACLE CIRCUIT.
2. FIELD ERECTED CUSTOM UNIT.
3. WHERE CO DEMAND VENT CONTROL IS REQUIRED PER ATC SPECIFICATIONS, OUTDOOR AIR MINIMUM CFM INDICATED IS THE TOTAL MINIMUM CFM CAPACITY, WHICH CAPACITIES ARE BASED UPON AND UNIT BALANCED TO.
4. TSP INCLUDES DIRTY FILTER ALLOWANCE. SEE GENERAL NOTES.
5. WITH PLATE FORM GRATE AND ACCESS LADDER
6. HEATING COIL WITH FREEZE PUMP, 4 COILS STACKED.
7. STACKED DIRECT DRIVE FANS PLATFORM GRATE AND ACCESS LADDER
8. 48" ACCESS SECTION (MIN)
9. 60" ACCESS SECTION (MIN)
10. NOT USED
11. 5' LONG SOUND ATTENUATOR
12. WHERE (2) FANS ARE INDICATED, EACH FAN SHALL HAVE INDEPENDENT VFC AND POWER CIRCUIT.
13. MERV 8 PREFILTER
14. HIGH CAPACITY HEPA FINAL FILTER WITH 4" SECONDARY PREFILTER RACK. PREFILTER RACK TO BE SUITABLE FOR 4" PLEATED CARBON FILTER IN FUTURE. (1)
15. SEE DETAIL ON THIS SHEET.
16. HEAT PIPE HEAT RECOVERY SECTION WITH BYPASS DAMPER, 3 FULL LENGTH SECTIONS STACKED WITH TOP PULL ACCESS, 35% TEMP EFFICIENCY (1)
17. SEE HUMIDIFIER SCHEDULE
18. DIRECT DRIVE PLENUM SWSI
19. PROVIDE 20A-1P TOGGLE SWITCH
20. PROVIDE FUSE SIZES AS RECOMMENDED BY MANUFACTURER

AHU MODULE ABBREVIATIONS

AFS = ANGULAR FILTER SECTION
AS = ACCESS SECTION
BL = BLENDER SECTION
CC = COOLING COIL
DP = DISCHARGE PLENUM
DIF = DIFFUSER SECTION
ECO = ECONOMIZER / INLET SECTION
HR = HEAT RECOVERY SECTION
MB = MIXING BOX
IP = INTAKE PLENUM
SA = SOUND ATTENUATOR
RFS = RETURN FAN SECTION
SFS = SUPPLY FAN SECTION
UV = ULTRAVIOLET LIGHT SECTION
WHC = HOT WATER HEATING COIL

AIR HANDLING UNIT (AHU) - GENERAL

UNIT NUMBER	AREA SERVED	TYPE	MODEL	SIZE (W x H)	DESIGN CFM			REMARKS
					COOLING SUPPLY	HEATING SUPPLY	OUTDOOR AIR MINIMUM	
AHU-1S	B BLDG	(2)	–	(15)	70,000	70,000	70,000	SUPPLY
AHU-1E	B BLDG	(2)		(15)				EXHAUST

AHU MODULES

UNIT NUMBER	MODULES IN DIRECTION OR AIRFLOW																	
	IP	SA	AFS	HR	AS	WHC	HUM	AS	CC	UV	AS	SFS	SA	AS	AFS	DP		
AHU-1S	(5)		(13)	(16)	(8)	(6)	(17)	(8)	X	X	(9)	(7)	(11)	(5)	(14)	X		
AHU-1E	(5)		(13)	(16)	(9)													

AHU SUPPLY FAN

UNIT NUMBER	CFM	E.S.P. (IN W.G.)	T.S.P. (IN W.G.)	TYPE	SIZE	CLASS	RPM	HP		VFC
								BHP	MOTOR HP	(12)
AHU-1SFA	35,000	2.5"	9.6"	(18)	365	3	1714	70.7	100	YES
AHU-1SFB	35,000	2.5"	9.6"	(18)	365	3	1714	70.7	100	YES
AHU-1E	–	–	–	–	–	–	–	–	–	–

AHU MAIN HW HEATING COIL

UNIT NUMBER	E.A.T. DB (°F)	L.A.T. DB (°F)	MBH	EWT (°F)	LWT (°F)	GPM	S&R PIPE SIZE	FPM	APD (IN)	WPD (FT)	ROW	FPI
AHU-1S	3	60	4500	180	140	300	4"	646	.25	4.0	2	8
AHU-1E	–	–	–	–	–	–	–	–	–	–	–	–

AHU CHW COOLING COIL

UNIT NUMBER	E.A.T. DB/WB (°F)	L.A.T. DB/WB (°F)	MBH		EWT (°F)	LWT (°F)	GPM	CHW S & R PIPE SIZE (IN)	FPM	APD (IN)	WPD (FT)	ROW	FPI
			TOTAL	SENS									
AHU-1S	91/74	50/49	5413	3135	45	57	925	8"	497	1.75	21	10	10
AHU-1E	–	–	–	–	–	–	–	–	–	–	–	–	–

AHU HEAT PIPE COIL

UNIT NUMBER	CFM	SUMMER		EFF	WINTER		EFF	FPM	APD (IN)	ROW	FPI
		E.A.T. DB/WB	L.A.T. DB/WB		E.A.T. DB/WB	L.A.T. DB/WB					
AHU-1S	70,000	91/74	85/72	35	3/3	27/21	36	575	.83	8	8
AHU-1E	75,000	75/63	80/64	33	70/52	48/43	33	620	.91	8	8
TOTAL HEAT REC:		434 MBH			1800 MBH						

AHU ELECTRICAL REQUIREMENTS

UNIT NUMBER	VOLTS/ PHASE	HOMERUN	BRANCH CIRCUIT SIZE	SW SIZE	REMARKS
AHU-1SFA	460/3	300A-3P EPPHPHBF	3 #3/0 & 1 #3 GND IN 2"C.	400A	(20) (1)
AHU-1SFB	460/3	300A-3P EPPHPHBF	3 #3/0 & 1 #3 GND IN 2"C.	400A	(20) (1)
AHU-1LR	120/1	20A-1P ELPHF	2 #12 & 1 #12 GND IN 3/4"C.	(19)	(1)
AHU-1UV	120/1	20A-1P ELPHF	2 #12 & 1 #12 GND IN 3/4"C.	(19)	(1)

AHU SOUND PERFORMANCE SCHEDULE

TAG	REFERENCE LOCATION	TOTAL CFM	SOUND ATTENUATOR			INSERTION/TRANSMISSION LOSSES OCTAVE BAND FREQUENCIES (Hz)							dBA
			MAX PRESS DROP (IN WG)	SECTION (IN)	LENGTH (FT)	63	125	250	500	1K	2K	4K	8K	
AHU-1S	3 FT OUTSIDE SFS	70,000	N/A	N/A	N/A	11	17	22	27	31	35	41	47	79.6
AHU-1S	UNIT DISCHARGE	70,000	0.07	FULL SIZE OF UNIT	5	10	16	24	33	39	35	29	27	79.0
AHU-1S	UNIT INLET	70,000	N/A	N/A	N/A	11	9	6	0	0	0	0	0	105.7

FAN SCHEDULE

TAG	APPLICATION	MODEL NUMBER	TYPE	SIZE	CFM	ESP (IN WC)	RPM	MOTOR		VFC	UNIT CONTROL (1)
								BHP	HP		
EF-1A	GEN EXH	4025	(4)	40.25	25,000	6.0	1196	36.9	40	YES	(1)
EF-1B	GEN EXH	4025	(4)	40.25	25,000	6.0	1196	36.9	40	YES	(1)
EF-1C	GEN EXH	4025	(4)	40.25	25,000	6.0	1196	36.9	40	YES	(1)
EF-1D	GEN EXH	4025	(4)	40.25	25,000	6.0	1196	36.9	40	YES	(1)
EF-2A	CARCINOGEN RM SPECIALITY EXH	1225	(5)	13.5	1,800	3.0	3220	2.9	5	YES	(1)
EF-2B	CARCINOGEN RM SPECIALITY EXH (1)	1225	(5)	13.5	1,800	3.0	3220	2.9	5	YES	(1)

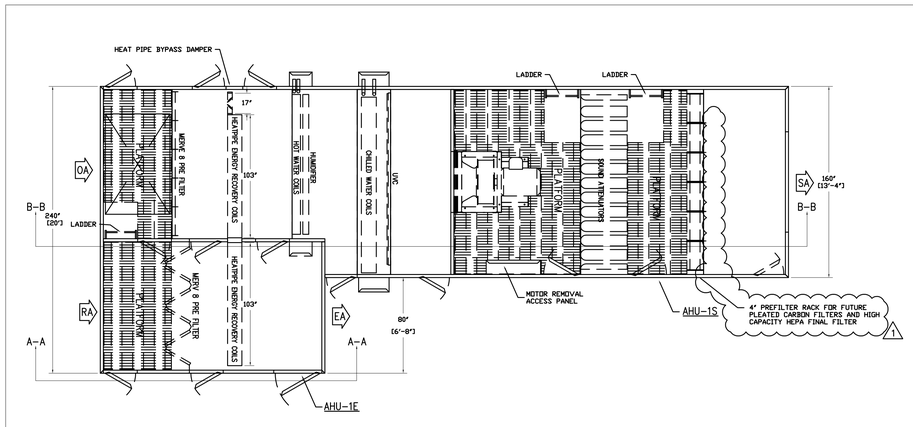
TAG	VOLTS / PHASE	HOMERUN	BRANCH CIRCUIT SIZE	SW SIZE	REMARKS
EF-1A	460/3	125A-3P EPPHPHBF	3 #2 + 1 #6 G. – 1 1/4" C.	100/80A	(3)
EF-1B	460/3	125A-3P EPPHPHBF	3 #2 + 1 #6 G. – 1 1/4" C.	100/80A	(3)
EF-1C	460/3	125A-3P EPPHPHBF	3 #2 + 1 #6 G. – 1 1/4" C.	100/80A	(3)
EF-1D	460/3	125A-3P EPPHPHBF	3 #2 + 1 #6 G. – 1 1/4" C.	100/80A	(3)
EF-2A	460/3	15A-3P EPPHPHBF	3 #10 + 1 #10 G. – 3/4" C.	30/12A	(3)
EF-2B	460/3	15A-3P EPPHPHBF	3 #10 + 1 #10 G. – 3/4" C.	30/12A	(3)

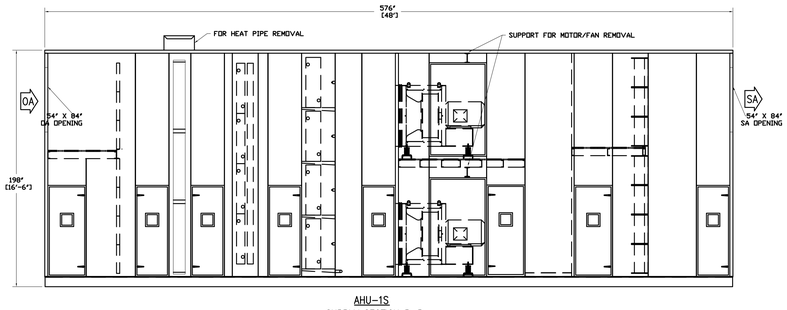
GENERAL NOTES

1. MANUFACTURER MODELS BASED UPON MK PLASTICS AXIJET.
2. PROVIDE INTERNAL LIGHT WIRED FOR SINGLE POINT CONNECTION, PLENUM FLOOR WITH GRATED INTAKE CONNECTION, ACCESS DOOR FOR EF-1 COMMON PLENUM.

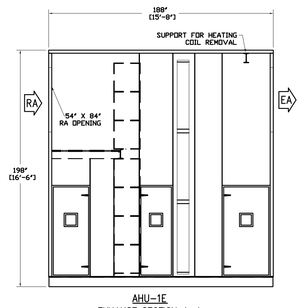
SCHEDULE NOTES

1. SEE ATC CONTROL DRAWINGS.
2. PROVIDE 20A-1P TOGGLE SWITCH.
3. PROVIDE FUSE SIZES AS RECOMMENDED BY MANUFACTURER
4. (4) HIGH PLUME DIRECT DRIVE EXHAUST FANS (3 RUN, 1 STANDBY) COMBINATION UNIT WITH COMMON PLENUM, BYPASS INTAKE DAMPERS AND CONTROL
5. (2) HIGH PLUME DIRECT DRIVE EXHAUST FANS, (2 RUN @ 50% EACH SIDED FOR 100%) COMBINATION UNIT WITH COMMON PLENUM, BYPASS INTAKE, DAMPER, AND CONTROL. FANS SHALL BE SELECTED TO SUITABLE OPERATE IN A RANGE OF 1200-1800CFM FOR 100%, 600-1200CFM FOR 50%.





AHU-1S
SUPPLY SECTION B-B



AHU-1E
EXHAUST SECTION A-A

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ADDENDUM B

NO	ISSUE	DATE
1	ADDENDUM B	08/16/13

Sheet Information

Date	16 AUGUST, 2013
Job Number	155064.000
Drawn	DP/KLB/HP
Checked	JRD
Approved	GI

Title

MEP SCHEDULES

Sheet

MEP-302

AIRFLOW CONTROL VALVE SCHEDULE

TAG ID	MFR	MODEL	QUANTITY	VALVE SIZE (IN)	VALVE COATING (1)	PRESSURE DROP (IN WG)	OPERATING CFM MAX	OPERATING CFM MIN (4)	APPLICATION	REMARKS
AV-1-1A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-1-1B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-1-1C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-1-1D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-1-2A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-1-2B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-1-2C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-1-2D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-1-3A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-1-3B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-1-3C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-1-3D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-1-4A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-1-4B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-1-4C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-1-4D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-1-5A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-1-5B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-1-5C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-1-5D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-1-6A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-1-6B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-1-6C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-1-6D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-1-7A	PHOENIX		1	8"	A	0.3"-3.0"	170	50	SUPPLY	(2)
AV-1-7B	PHOENIX		1	10"	A	0.3"-3.0"	370	250	EXHAUST	(2)
AV-1-8A	PHOENIX		1	8"	A	0.3"-3.0"	170	50	SUPPLY	(2)
AV-1-8B	PHOENIX		1	10"	A	0.3"-3.0"	370	250	EXHAUST	(2)
AV-1-9A	PHOENIX		1	8"	A	0.3"-3.0"	50	50	SUPPLY	
AV-1-9B	PHOENIX		1	12"	A	0.3"-3.0"	425	425	EXHAUST	
AV-1-10A	PHOENIX		2	12"	A	0.3"-3.0"	1500	375	SUPPLY	
AV-1-10B	PHOENIX		2	12"	A	0.3"-3.0"	1625	500	EXHAUST	
AV-1-11A	PHOENIX		1	12"	A	0.3"-3.0"	800	100	SUPPLY	
AV-1-11B	PHOENIX		1	14"	A	0.3"-3.0"	1100	750	EXHAUST	
AV-1-11C	PHOENIX		1	14"	A	0.3"-3.0"	1100	750	EXHAUST	
AV-2-1A	PHOENIX		1	12"	A	0.3"-3.0"	550	550	SUPPLY	(2)
AV-2-1B	PHOENIX		1	12"	A	0.3"-3.0"	750	750	EXHAUST	(2)
AV-2-2A	PHOENIX		1	12"	A	0.3"-3.0"	550	550	SUPPLY	(2)
AV-2-2B	PHOENIX		1	12"	A	0.3"-3.0"	750	750	EXHAUST	(2)
AV-2-3A	PHOENIX		1	12"	A	0.3"-3.0"	550	550	SUPPLY	(2)
AV-2-3B	PHOENIX		1	12"	A	0.3"-3.0"	750	750	EXHAUST	(2)
AV-2-4A	PHOENIX		1	12"	A	0.3"-3.0"	550	550	SUPPLY	(2)
AV-2-4B	PHOENIX		1	12"	A	0.3"-3.0"	750	750	EXHAUST	(2)
AV-2-5A	PHOENIX		1	12"	A	0.3"-3.0"	550	550	SUPPLY	(2)
AV-2-5B	PHOENIX		1	12"	A	0.3"-3.0"	750	750	EXHAUST	(2)
AV-2-6A	PHOENIX		1	12"	A	0.3"-3.0"	550	550	SUPPLY	(2)
AV-2-6B	PHOENIX		1	12"	A	0.3"-3.0"	750	750	EXHAUST	(2)
AV-2-7A	PHOENIX		1	12"	A	0.3"-3.0"	675	300	SUPPLY	(2), (7)
AV-2-7B	PHOENIX		1	14"	B	0.3"-3.0"	875	500	EXHAUST	(2), (7)
AV-2-8A	PHOENIX		1	8"	A	0.3"-3.0"	50	50	SUPPLY	
AV-2-8B	PHOENIX		1	12"	A	0.3"-3.0"	425	425	EXHAUST	
AV-2-9A	PHOENIX		2	12"	A	0.3"-3.0"	1500	375	SUPPLY	
AV-2-9B	PHOENIX		2	12"	A	0.3"-3.0"	1625	500	EXHAUST	
AV-2-10A	PHOENIX		1	12"	A	0.3"-3.0"	800	800	SUPPLY	
AV-3-1A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-3-1B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-3-1C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-3-1D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-3-2A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-3-2B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-3-2C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-3-2D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-3-3A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-3-3B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-3-3C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-3-3D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-3-4A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-3-4B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-3-4C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-3-4D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-3-5A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-3-5B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-3-5C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-3-5D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-3-6A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-3-6B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-3-6C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-3-6D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-3-7A	PHOENIX		1	8"	A	0.3"-3.0"	170	50	SUPPLY	(2)
AV-3-7B	PHOENIX		1	10"	A	0.3"-3.0"	370	250	EXHAUST	(2)
AV-3-8A	PHOENIX		1	8"	A	0.3"-3.0"	170	50	SUPPLY	(2)
AV-3-8B	PHOENIX		1	10"	A	0.3"-3.0"	370	250	EXHAUST	(2)
AV-3-9A	PHOENIX		1	8"	A	0.3"-3.0"	50	50	SUPPLY	
AV-3-9B	PHOENIX		1	12"	A	0.3"-3.0"	425	425	EXHAUST	
AV-3-10A	PHOENIX		2	12"	A	0.3"-3.0"	1500	375	SUPPLY	
AV-3-10B	PHOENIX		2	12"	A	0.3"-3.0"	1625	500	EXHAUST	
AV-3-11A	PHOENIX		1	12"	A	0.3"-3.0"	800	100	SUPPLY	
AV-3-11B	PHOENIX		1	14"	A	0.3"-3.0"	1100	750	EXHAUST	
AV-3-11C	PHOENIX		1	14"	A	0.3"-3.0"	1100	750	EXHAUST	
AV-4-1A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-4-1B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-4-1C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-4-1D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-4-2A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-4-2B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-4-2C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-4-2D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-4-3A	PHOENIX		1	10"	A	0.3"-3.0"	175	50	SUPPLY	(2)
AV-4-3B	PHOENIX		1	10"	A	0.3"-3.0"	375	250	EXHAUST	(2)
AV-4-4A	PHOENIX		1	10"	A	0.3"-3.0"	75	50	SUPPLY	(2)
AV-4-4B	PHOENIX		1	10"	A	0.3"-3.0"	275	250	EXHAUST	(2)
AV-4-5A	PHOENIX		1	8"	A	0.3"-3.0"	80	50	SUPPLY	(2)
AV-4-5B	PHOENIX		1	10"	A	0.3"-3.0"	280	250	EXHAUST	(2)
AV-4-6A	PHOENIX		1	8"	A	0.3"-3.0"	125	100	SUPPLY	(2)
AV-4-6B	PHOENIX		1	10"	A	0.3"-3.0"	325	300	EXHAUST	(2)
AV-4-7A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-4-7B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-4-7C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-4-7D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-4-8A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-4-8B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-4-8C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-4-8D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-4-9A	PHOENIX		1	8"	A	0.3"-3.0"	170	50	SUPPLY	(2)
AV-4-9B	PHOENIX		1	10"	A	0.3"-3.0"	370	250	EXHAUST	(2)
AV-4-10A	PHOENIX		1	8"	A	0.3"-3.0"	170	50	SUPPLY	(2)
AV-4-10B	PHOENIX		1	10"	A	0.3"-3.0"	370	250	EXHAUST	(2)
AV-4-11A	PHOENIX		1	8"	A	0.3"-3.0"	50	50	SUPPLY	
AV-4-11B	PHOENIX		1	12"	A	0.3"-3.0"	425	425	EXHAUST	
AV-4-12A	PHOENIX		2	12"	A	0.3"-3.0"	1500	375	SUPPLY	
AV-4-12B	PHOENIX		2	12"	A	0.3"-3.0"	1625	500	EXHAUST	
AV-4-13A	PHOENIX		1	12"	A	0.3"-3.0"	625	350	SUPPLY	
AV-4-13B	PHOENIX		1	10"	A	0.3"-3.0"	325	50	EXHAUST	
AV-4-14A	PHOENIX		1	8"	A	0.3"-3.0"	150	150	SUPPLY	
AV-4-14B	PHOENIX		1	14"	A	0.3"-3.0"	1050	1050	EXHAUST	
AV-5-1A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-5-1B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-5-2A	PHOENIX		1	12"	A	0.3"-3.0"	650	450	SUPPLY	(2), (7)
AV-5-2B	PHOENIX		1	12"	A	0.3"-3.0"	650	90	EXHAUST	(2), (7)
AV-5-2C	PHOENIX		1	4"	A	0.3"-3.0"	50	50	EXHAUST	(3)
AV-5-2D	PHOENIX		1	4"	A	0.3"-3.0"	50	50	EXHAUST	(3)
AV-5-2E	PHOENIX		1	12"	B	0.3"-3.0"	650	90	EXHAUST	(2), (7)
AV-5-2F	PHOENIX		1	8"	B	0.3"-3.0"	200	200	EXHAUST	(2), (7)

GENERAL NOTES:

1. BASIS OF DESIGN MANUFACTURER: PHOENIX
2. ALL VALVES ARE STANDARD TYPE UNLESS NOTED OTHERWISE.
3. VALVE MAX CAPACITY SHALL EXCEED MAX CFM BY 20%.
4. PROVIDE NEUTRALIZER FOR ALL AIR VALVES EXCEPT WHERE MANUAL CAGE RACK VALVES INDICATED.

SCHEDULE NOTES:

(1) SEE SPECIFICATIONS FOR VALVE CLASS CONSTRUCTION.
(2) PROVIDE SHUTOFF TYPE VALVE AS DEFINED IN SPECIFICATIONS.
(3) PROVIDE MANUAL CAGERACK VALVE.
(4) WHERE VALVE MINIMUM NOT INDICATED MINIMUM TO BE SET TO MAINTAIN ROOM MINIMUM AIR CHANGE RATE LISTED IN BASIS OF DESIGN AND NET TRANSFER CFM INDICATED ON ROOM AIRFLOW AND PRESSURIZATION FLOOR PLAN.
(5) PROVIDE TWO-POSITION TYPE VALVE AS DEFINED IN SPECIFICATIONS.
(6) PROVIDE CONSTANT VOLUME TYPE AIR VALVE.
(7) PROVIDE FAST-ACTING AIR VALVE ACTUATOR AS DEFINED IN SPECIFICATIONS.

AIRFLOW CONTROL VALVE SCHEDULE

TAG ID	MFR	MODEL	QUANTITY	VALVE SIZE (IN)	VALVE COATING (1)	PRESSURE DROP (IN WG)	OPERATING CFM MAX	OPERATING CFM MIN (4)	APPLICATION	REMARKS
AV-5-3A	PHOENIX		1	12"	A	0.3"-3.0"	450	450	SUPPLY	(2), (7)
AV-5-3B	PHOENIX		1	12"	A	0.3"-3.0"	650	90	EXHAUST	(2), (7)
AV-5-3C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-5-3D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-5-3E	PHOENIX		1	12"	B	0.3"-3.0"	650	90	EXHAUST	(2), (7)
AV-5-4A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-5-4B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-5-4C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-5-4D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-5-5A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-5-5B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-5-5C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-5-5D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-5-6A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-5-6B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-5-7A	PHOENIX		1	8"	A	0.3"-3.0"	170	50	SUPPLY	(2)
AV-5-7B	PHOENIX		1	10"	A	0.3"-3.0"	370	250	EXHAUST	(2)
AV-5-8A	PHOENIX		1	8"	A	0.3"-3.0"	170	50	SUPPLY	(2)
AV-5-8B	PHOENIX		1	10"	A	0.3"-3.0"	370	250	EXHAUST	(2)
AV-5-9A	PHOENIX		1	8"	A	0.3"-3.0"	50	50	SUPPLY	
AV-5-9B	PHOENIX		1	12"	A	0.3"-3.0"	425	425	EXHAUST	
AV-5-10A	PHOENIX		2	12"	A	0.3"-3.0"	1500	375	SUPPLY	
AV-5-10B	PHOENIX		2	12"	A	0.3"-3.0"	1625	500	EXHAUST	
AV-5-11A	PHOENIX		1	12"	A	0.3"-3.0"	800	100	SUPPLY	
AV-5-11B	PHOENIX		1	14"	A	0.3"-3.0"	900	550	EXHAUST	
AV-5-11C	PHOENIX		1	14"	A	0.3"-3.0"	900	550	EXHAUST	
AV-6-1A	PHOENIX		1	12"	A	0.3"-3.0"	400	400	SUPPLY	(2)
AV-6-1B	PHOENIX		1	12"	A	0.3"-3.0"	600	600	EXHAUST	(2)
AV-6-1C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-6-1D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-6-2A	PHOENIX		1	10"	A	0.3"-3.0"	125	125	SUPPLY	(2)
AV-6-2B	PHOENIX		1	10"	A	0.3"-3.0"	325	325	EXHAUST	(2)
AV-6-2C	PHOENIX		1	12"	A	0.3"-3.0"	400	400	SUPPLY	(2)
AV-6-3A	PHOENIX		1	12"	A	0.3"-3.0"	400	400	SUPPLY	(2)
AV-6-3B	PHOENIX		1	12"	A	0.3"-3.0"	600	600	EXHAUST	(2)
AV-6-3C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-6-3D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-6-4A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-6-4B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-6-4C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-6-4D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-6-5A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-6-5B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-6-5C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-6-5D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-6-6A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-6-6B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-6-6C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-6-6D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-6-7A	PHOENIX		1	8"	A	0.3"-3.0"	170	50	SUPPLY	(2)
AV-6-7B	PHOENIX		1	10"	A	0.3"-3.0"	370	250	EXHAUST	(2)
AV-6-8A	PHOENIX		1	8"	A	0.3"-3.0"	170	50	SUPPLY	(2)
AV-6-8B	PHOENIX		1	10"	A	0.3"-3.0"	370	250	EXHAUST	(2)
AV-6-9A	PHOENIX		1	8"	A	0.3"-3.0"	50	50	SUPPLY	
AV-6-9B	PHOENIX		1	12"	A	0.3"-3.0"	425	425	EXHAUST	
AV-6-10A	PHOENIX		2	12"	A	0.3"-3.0"	1500	375	SUPPLY	
AV-6-10B	PHOENIX		2	12"	A	0.3"-3.0"	1625	500	EXHAUST	
AV-6-11A	PHOENIX		1	12"	A	0.3"-3.0"	800	100	SUPPLY	
AV-6-11B	PHOENIX		1	14"	A	0.3"-3.0"	700	350	EXHAUST	
AV-6-11C	PHOENIX		1	14"	A	0.3"-3.0"	700	350	EXHAUST	
AV-7-1A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-7-1B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-7-1C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-7-1D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-7-2A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-7-2B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-7-2C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-7-2D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-7-3A	PHOENIX		1	10"	A	0.3"-3.0"	175	50	SUPPLY	(2)
AV-7-3B	PHOENIX		1	12"	A	0.3"-3.0"	375	250	EXHAUST	(2)
AV-7-4A	PHOENIX		1	10"	A	0.3"-3.0"	100	50	SUPPLY	(2)
AV-7-4B	PHOENIX		1	10"	A	0.3"-3.0"	300	250	EXHAUST	(2)
AV-7-5A	PHOENIX		1	12"	A	0.3"-3.0"	265	265	SUPPLY	(2)
AV-7-5B	PHOENIX		1	8"	A	0.3"-3.0"	465	465	EXHAUST	(2)
AV-7-5C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-7-5D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-7-6A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-7-6B	PHOENIX		1	8"	A	0.3"-3.0"	265	465	EXHAUST	(2)
AV-7-6C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-7-6D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-7-7A	PHOENIX		1	12"	A	0.3"-3.0"	465	465	SUPPLY	(2)
AV-7-7B	PHOENIX		1	8"	A	0.3"-3.0"	265	265	EXHAUST	(2)
AV-7-7C	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-7-7D	PHOENIX		1	4"	A	0.6"-3.0"	50	50	EXHAUST	(3)
AV-7-8A	PHOENIX		1	8"	A	0.3"-3.0"	150	50	SUPPLY	(2)
AV-7-8B	PHOENIX		1	10"	A	0.3"-3.0"	250	150	EXHAUST	(2)
AV-7-9A	PHOENIX		1	8"	A	0.3"-3.0"	150	50	SUPPLY	(2)
AV-7-9B	PHOENIX		1	10"	A	0.3"-3.0"	250 1	150	EXHAUST	(2)
AV-7-10A	PHOENIX		1	10"	A	0.3"-3.0"	450	450	SUPPLY	
AV-7-10B	PHOENIX		1	12"	A	0.3"-3.0"	625	625	EXHAUST	
AV-7-11A	PHOENIX		2	12"	A	0.3"-3.0"	1500	375	SUPPLY	
AV-7-11B	PHOENIX		2	12"	A	0.3"-3.0"	1325	500	EXHAUST	
AV-7-12A	PHOENIX		1	12"	A	0.3"-3.0"	650	250	SUPPLY	
AV-7-12B	PHOENIX		1	12"	A	0.3"-3.0"	450	50	EXHAUST	
AV-7-13A	PHOENIX		1	8"	A	0.3"-3.0"	175	175	SUPPLY	
AV-7-13B	PHOENIX		2	12"	A	0.3"-3.0"	1475	1475	EXHAUST	
AV-B-1A	PHOENIX		1	12"	A	0.3"-3.0"	450	100	SUPPLY	(2)
AV-B-1B	PHOENIX		1	12"	A	0.3"-3.0"	650	300	EXHAUST	(2)
AV-B-2A	PHOENIX		1	10"	A	0.3"-3.0"	300	100	SUPPLY	(2)
AV-B-2B	PHOENIX		1	12"	A	0.3"-3.0"	700 1	500 1	EXHAUST	(2)
AV-B-3A	PHOENIX		1	12"	A	0.3"-3.0"	600	500	SUPPLY	(2)
AV-B-3B	PHOENIX		1	12"	A	0.3"-3.0"	400	300	EXHAUST	(2)
AV-B-4A	PHOENIX		1	12"	A	0.3"-3.0"	650 1	450 1	SUPPLY	
AV-B-4B	PHOENIX		1	10"	A	0.3"-3.0"	250	50	EXHAUST	
AV-B-5B	PHOENIX		1	8"	A	0.3"-3.0"	100	100	EXHAUST	
AV-PH-1A	PHOENIX		2	12"	A	0.3"-3.0"	1200	180	SUPPLY	
AV-PH-1B	PHOENIX		2	12"	A	0.3"-3.0"	1200	180	RETURN	

HOT WATER HEATING COIL

TAG ID	MFR	CFM	HEIGHT (1)	WIDTH (1)	EAT (°F)	LAT (°F)	MAX APD (IN WG)	MAX WPD (FT)	MBH	GPM	PIPE SIZE (IN)
RHC-1-1	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-1-2	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-1-3	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-1-4	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-1-5	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-1-6	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-1-7	TRANE	170 CFM	8"	8"	55	80	0.25	5	5	0.25	3/4
RHC-1-8	TRANE	170 CFM	8"	8"	55	80	0.25	5	5	0.25	3/4
RHC-1-9	TRANE	50 CFM	8"	8"	55	80	0.25	5	2	0.25	3/4
RHC-1-10	TRANE	1500 CFM	12"	24"	55	80	0.25	5	41	2	3/4
RHC-1-11	TRANE	800 CFM	12"	12"	55	80	0.25	5	22	1	3/4
RHC-2-1	TRANE	550 CFM	12"	12"	55	80	0.25	5	15	0.75	3/4
RHC-2-2	TRANE	550 CFM	12"	12"	55	80	0.25	5	15	0.75	3/4
RHC-2-3	TRANE	550 CFM	12"	12"	55	80	0.25	5	15	0.75	3/4
RHC-2-4	TRANE	550 CFM	12"	12"	55	80	0.25	5	15	0.75	3/4
RHC-2-5	TRANE	550 CFM	12"	12"	55	80	0.25	5	15	0.75	3/4
RHC-2-6	TRANE	550 CFM	12"	12"	55	80	0.25	5	15	0.75	3/4
RHC-2-7	TRANE	675 CFM	12"	12"	55	80	0.25	5	19	1	3/4
RHC-2-8	TRANE	50 CFM	8"	8"	55	80	0.25	5	2	0.25	3/4
RHC-2-9	TRANE	1500 CFM	12"	24"	55	80	0.25	5	41	2	3/4
RHC-2-10	TRANE	800 CFM	12"	12"	55	80	0.25	5	22	1	3/4
RHC-3-1	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-3-2	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-3-3	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-3-4	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-3-5	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-3-6	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-3-7	TRANE	170 CFM	8"	8"	55	80	0.25	5	5	0.25	3/4
RHC-3-8	TRANE	170 CFM	8"	8"	55	80	0.25	5	5	0.25	3/4
RHC-3-9	TRANE	50 CFM	8"	8"	55	80	0.25	5	2	0.25	3/4
RHC-3-10	TRANE	1500 CFM	12"	24"	55	80	0.25	5	41	2	3/4
RHC-3-11	TRANE	800 CFM	12"	12"	55	80	0.25	5	22	1	3/4
RHC-4-1	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-4-2	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-4-3	TRANE	175 CFM	10"	10"	55	80	0.25	5	5	0.25	3/4
RHC-4-4	TRANE	75 CFM	10"	10"	55	80	0.25	5	3	0.25	3/4
RHC-4-5	TRANE	80 CFM	8"	8"	55	80	0.25	5	3	0.25	3/4
RHC-4-6	TRANE	125 CFM	8"	8"	55	80	0.25	5	4	0.25	3/4
RHC-4-7	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-4-8	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-4-9	TRANE	170 CFM	8"	8"	55	80	0.25	5	5	0.25	3/4
RHC-4-10	TRANE	170 CFM	8"	8"	55	80	0.25	5	5	0.25	3/4
RHC-4-11	TRANE	50 CFM	10"	10"	55	80	0.25	5	2	0.25	3/4
RHC-4-12	TRANE	1500 CFM	12"	24"	55	80	0.25	5	41	2	3/4
RHC-4-13	TRANE	625 CFM	12"	12"	55	80	0.25	5	17	0.75	3/4
RHC-4-14	TRANE	150 CFM	8"	8"	55	80	0.25	5	5	0.25	3/4
RHC-5-1	TRANE	465 CFM	12"	12"	55	90	0.25	5	17.6	1	3/4
RHC-5-2	TRANE	650 CFM	12"	12"	55	80	0.25	5	18	1.0	3/4
RHC-5-3	TRANE	450 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-5-4	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-5-5	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-5-6	TRANE	465 CFM	12"	12"	55	90	0.25	5	17.6	1	3/4
RHC-5-7	TRANE	170 CFM	8"	8"	55	80	0.25	5	5	0.25	3/4
RHC-5-8	TRANE	170 CFM	8"	8"	55	80	0.25	5	5	0.25	3/4
RHC-5-9	TRANE	50 CFM	8"	8"	55	80	0.25	5	2	0.25	3/4
RHC-5-10	TRANE	1500 CFM	12"	24"	55	80	0.25	5	41	2	3/4
RHC-5-11	TRANE	800 CFM	12"	12"	55	80	0.25	5	22	1	3/4
RHC-6-1	TRANE	400 CFM	12"	12"	55	80	0.25	5	11	0.5	3/4
RHC-6-2A	TRANE	125 CFM	10"	10"	55	80	0.25	5	4	0.25	3/4
RHC-6-2B	TRANE	400 CFM	12"	12"	55	80	0.25	5	11	0.5	3/4
RHC-6-3	TRANE	400 CFM	12"	12"	55	80	0.25	5	11	0.5	3/4
RHC-6-4	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-6-5	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-6-6	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-6-7	TRANE	170 CFM	8"	8"	55	80	0.25	5	5	0.25	3/4
RHC-6-8	TRANE	170 CFM	8"	8"	55	80	0.25	5	5	0.25	3/4
RHC-6-9	TRANE	50 CFM	8"	8"	55	80	0.25	5	2	0.25	3/4
RHC-6-10	TRANE	1500 CFM	12"	24"	55	80	0.25	5	41	2	3/4
RHC-6-11	TRANE	800 CFM	12"	12"	55	80	0.25	5	22	1	3/4
RHC-7-1	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-7-2	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-7-3	TRANE	175 CFM	10"	10"	55	80	0.25	5	5	0.25	3/4
RHC-7-4	TRANE	100 CFM	10"	10"	55	80	0.25	5	3	0.25	3/4
RHC-7-5	TRANE	265 CFM	12"	12"	55	80	0.25	5	8	0.5	3/4
RHC-7-6	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-7-7	TRANE	465 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-7-8	TRANE	150 CFM	8"	8"	55	80	0.25	5	4	0.25	3/4
RHC-7-9	TRANE	150 CFM 1	8"	8"	55	80	0.25	5	3	0.25	3/4
RHC-7-10	TRANE	450 CFM	10"	10"	55	80	0.25	5	13	0.75	3/4
RHC-7-11	TRANE	1500 CFM	12"	24"	55	80	0.25	5	41	2	3/4
RHC-7-12	TRANE	650 CFM	12"	12"	55	80	0.25	5	18	1	3/4
RHC-7-13	TRANE	175 CFM	8"	8"	55	80	0.25	5	5	0.25	3/4
RHC-B-1	TRANE	450 CFM	12"	12"	55	80	0.25	5	13	0.75	3/4
RHC-B-2	TRANE	300 CFM	10"	10"	55	80	0.25	5	11	0.5	3/4
RHC-B-3	TRANE	600 CFM	12"	12"	55	80	0.25	5	17	0.75	3/4
RHC-B-4	TRANE	650 CFM 1	12"	12"	55	80	0.25	5	17 1	.75	3/4
RHC-G1	TRANE	9000 CFM	20"	20"	55	80	0.25	5	243	12.25	1 1/2
RHC-M1	TRANE	6000 CFM	20"	20"	55	80	0.25	5	162	8	1 1/4

GENERAL NOTES:

1. COIL PERFORMANCE BASED ON 180F EWT
2. PROVIDE TRANSITIONS FROM AIR VALVE AND NEUTRALIZER SIZES AS NEEDED.

SCHEDULE NOTES:

(1) VERIFY DIMENSIONS OF HEATING COIL COMPLY WITH MAXIMUM ALLOWABLE AIR PRESSURE DROP.

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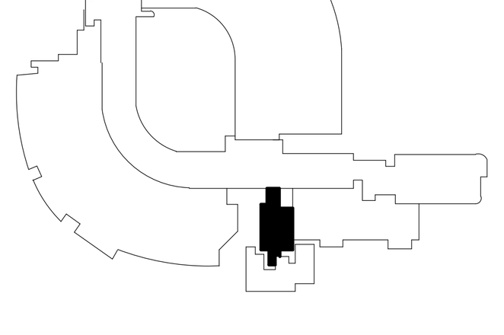

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MEP EQUIPMENT SCHEDULE

Sheet

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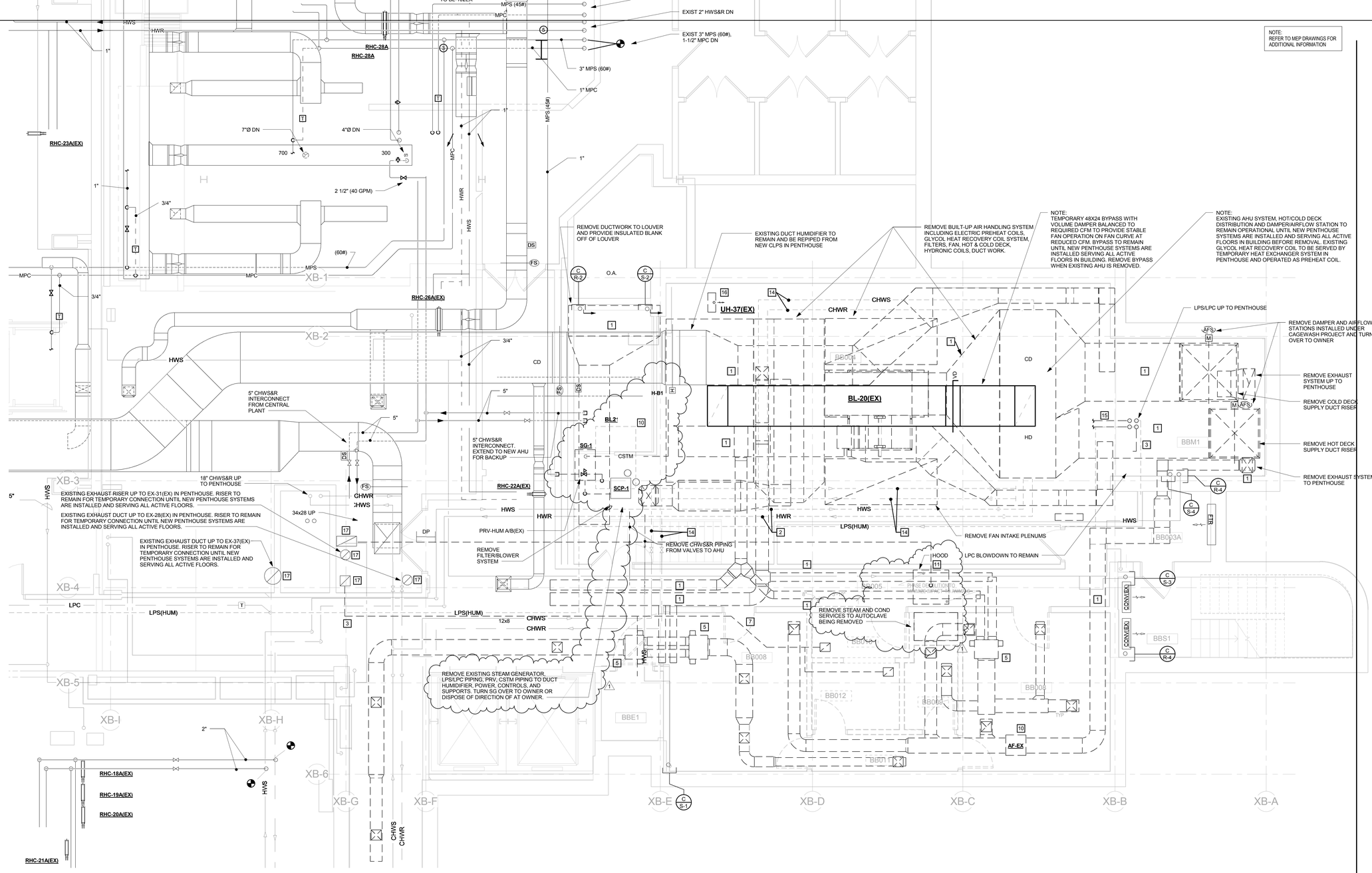

NOTE:
REFER TO MEP DRAWINGS FOR ADDITIONAL INFORMATION

DEMOLITION NOTES

1. REMOVE DUCT SYSTEM.
2. REMOVE HWS/HWR PIPING.
3. REMOVE MPS/MPC/LPS/LPC SYSTEM.
4. REMOVE REHEAT COIL SYSTEM.
5. REMOVE DUAL DUCT TERMINAL UNIT SYSTEM.
6. REMOVE THERMOSTAT/ROOM SENSOR.
7. REMOVE EXHAUST DUCT SYSTEM UP TO PENTHOUSE AND INCLUDING DUCTS AND FAN SYSTEM IN PENTHOUSE TO POINT OF DISCHARGE.
8. REMOVE TRANSFER DUCTS/GRILLES.
9. REMOVE DUCT MOUNTED COIL SYSTEM INCLUDING PIPING, DRAIN PAN, SUPPORTS, PIPING.
10. REMOVE EXHAUST FAN SYSTEM.
11. REMOVE EXHAUST HOOD.
12. REMOVE WALL HEATING UNIT SYSTEM.
13. REMOVE MPS TO PENTHOUSE/BASEMENT DISTRIBUTION TAKEOFF AND CAP.
14. REMOVE CHWS&R PIPING.
15. REMOVE GLYCOL HEAT RECOVERY PIPING SYSTEM. UPON COMPLETION OF TEMPORARY USE. SEE PENTHOUSE NOTES FOR ADDITIONAL INFORMATION.
16. REMOVE ELECTRIC UNIT HEATER.
17. **BASE BID:** CAP AND ABANDON-IN-PLACE EXISTING EXHAUST DUCT RISER.
    ALTERNATE H1: REMOVE EXISTING EXHAUST DUCT RISER.
18. **BASE BID:** REUSE AND CUT AND PATCH TO ACCOMMODATE NEW WORK.
    ALTERNATE H1: REPLACE EXISTING EXHAUST RISER.

1 HVAC DEMOLITION BASEMENT FLOOR PLAN
1/4" = 1'-0"

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HVAC DEMOLITION BASEMENT FLOOR PLAN

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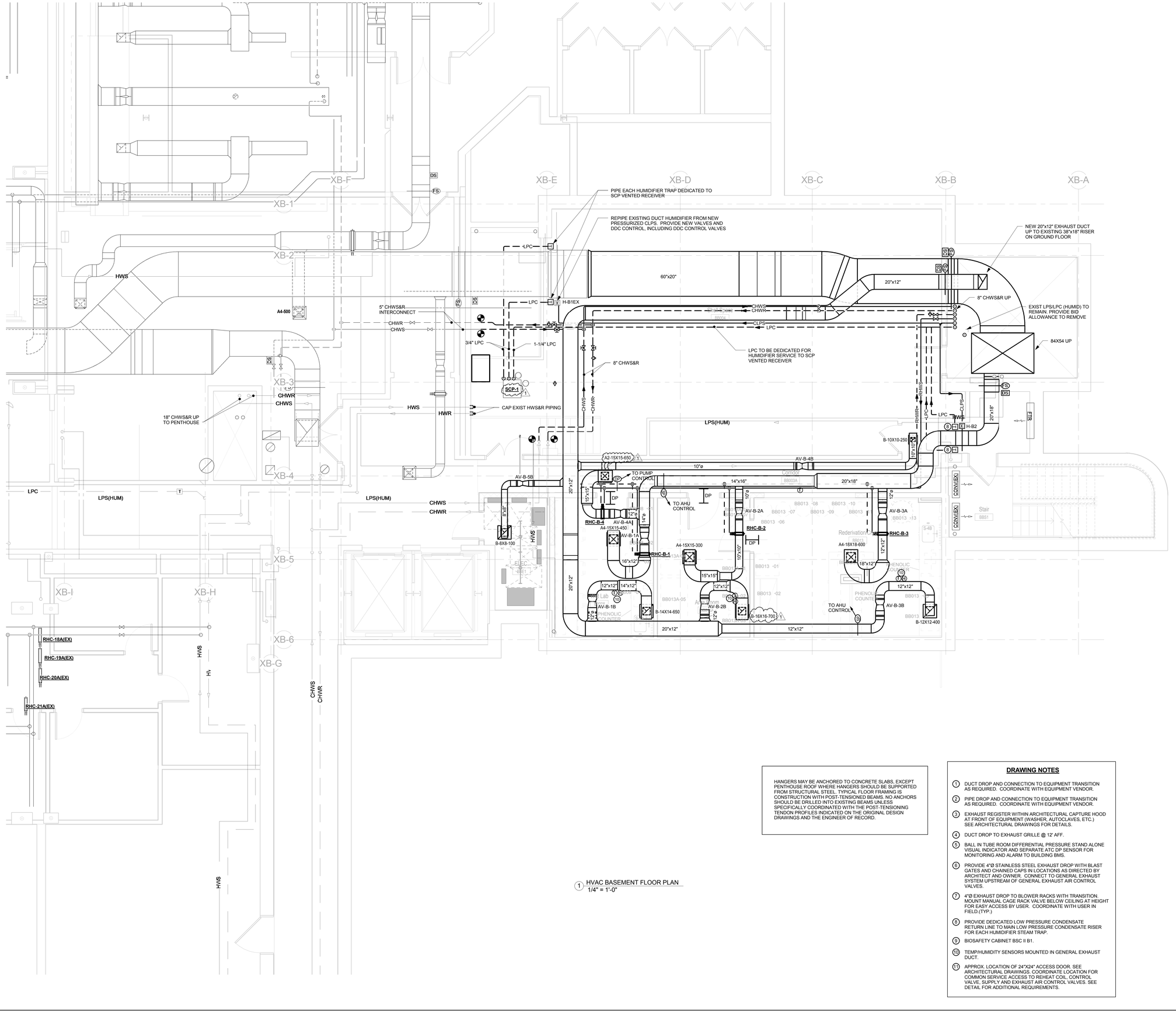

1 HVAC BASEMENT FLOOR PLAN
1/4" = 1'-0"

HANGERS MAY BE ANCHORED TO CONCRETE SLABS, EXCEPT PENTHOUSE ROOF WHERE HANGERS SHOULD BE SUPPORTED FROM STRUCTURAL STEEL. TYPICAL FLOOR FRAMING IS CONSTRUCTION WITH POST-TENSIONED BEAMS. NO ANCHORS SHOULD BE DRILLED INTO EXISTING BEAMS UNLESS SPECIFICALLY COORDINATED WITH THE POST-TENSIONING TENDON PROFILES INDICATED ON THE ORIGINAL DESIGN DRAWINGS AND THE ENGINEER OF RECORD.

DRAWING NOTES

1. DUCT DROP AND CONNECTION TO EQUIPMENT TRANSITION AS REQUIRED. COORDINATE WITH EQUIPMENT VENDOR.
2. PIPE DROP AND CONNECTION TO EQUIPMENT TRANSITION AS REQUIRED. COORDINATE WITH EQUIPMENT VENDOR.
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5. BALL IN TUBE ROOM DIFFERENTIAL PRESSURE STAND ALONE VISUAL INDICATOR AND SEPARATE ATC DP SENSOR FOR MONITORING AND ALARM TO BUILDING BMS.
6. PROVIDE 4"Ø STAINLESS STEEL EXHAUST DROP WITH BLAST GATES AND CHAINED CAPS IN LOCATIONS AS DIRECTED BY ARCHITECT AND OWNER. CONNECT TO GENERAL EXHAUST SYSTEM UPSTREAM OF GENERAL EXHAUST AIR CONTROL VALVES.
7. 4"Ø EXHAUST DROP TO BLOWER RACKS WITH TRANSITION. MOUNT MANUAL CAGE RACK VALVE BELOW CEILING AT HEIGHT FOR EASY ACCESS BY USER. COORDINATE WITH USER IN FIELD.(TYP.)
8. PROVIDE DEDICATED LOW PRESSURE CONDENSATE RETURN LINE TO MAIN LOW PRESSURE CONDENSATE RISER FOR EACH HUMIDIFIER STEAM TRAP.
9. BIOSAFETY CABINET BSC II B1.
10. TEMP/HUMIDITY SENSORS MOUNTED IN GENERAL EXHAUST DUCT.
11. APPROX. LOCATION OF 24"X24" ACCESS DOOR. SEE ARCHITECTURAL DRAWINGS. COORDINATE LOCATION FOR COMMON SERVICE ACCESS TO REHEAT COIL, CONTROL VALVE, SUPPLY AND EXHAUST AIR CONTROL VALVES. SEE DETAIL FOR ADDITIONAL REQUIREMENTS.

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HVAC BASEMENT FLOOR PLAN

Sheet

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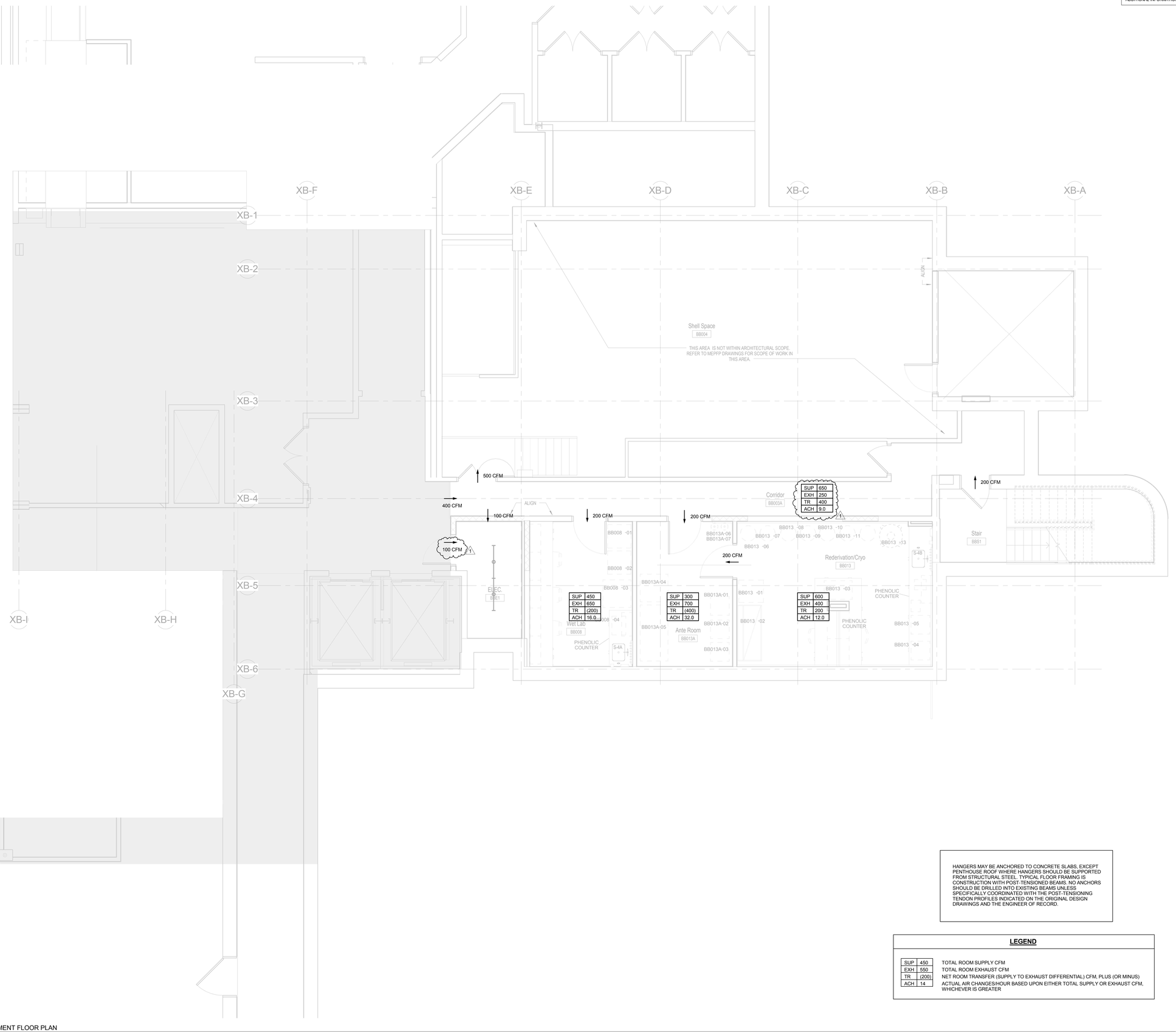

1 HVAC BASEMENT FLOOR PLAN
1/4" = 1'-0"

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LEGEND

SUP	450	TOTAL ROOM SUPPLY CFM
EXH	550	TOTAL ROOM EXHAUST CFM
TR	(200)	NET ROOM TRANSFER (SUPPLY TO EXHAUST DIFFERENTIAL) CFM, PLUS (OR MINUS)
ACH	14	ACTUAL AIR CHANGES/HOUR BASED UPON EITHER TOTAL SUPPLY OR EXHAUST CFM, WHICHEVER IS GREATER

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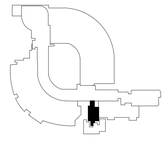

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HVAC ROOM AIRFLOW & PRESSURIZATION BASEMENT FLOOR PLAN

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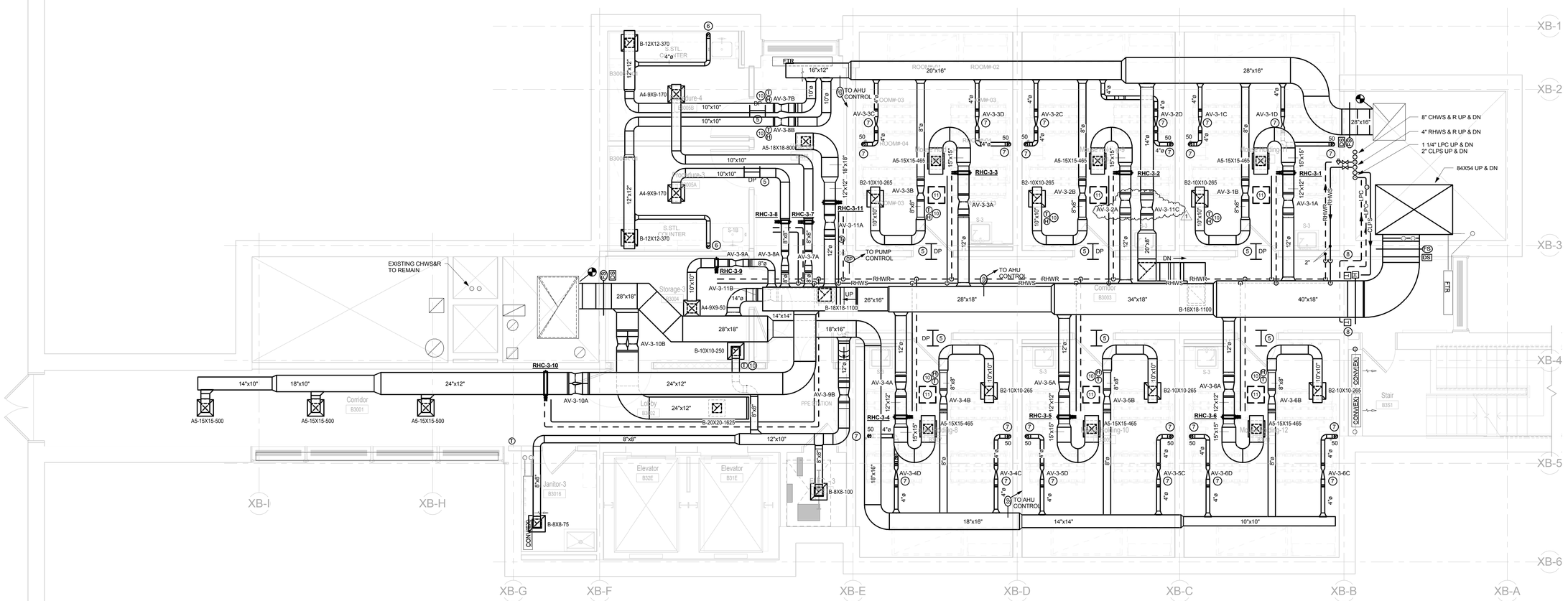

1 HVAC THIRD FLOOR PLAN
1/4" = 1'-0"

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HVAC THIRD FLOOR PLAN

Sheet

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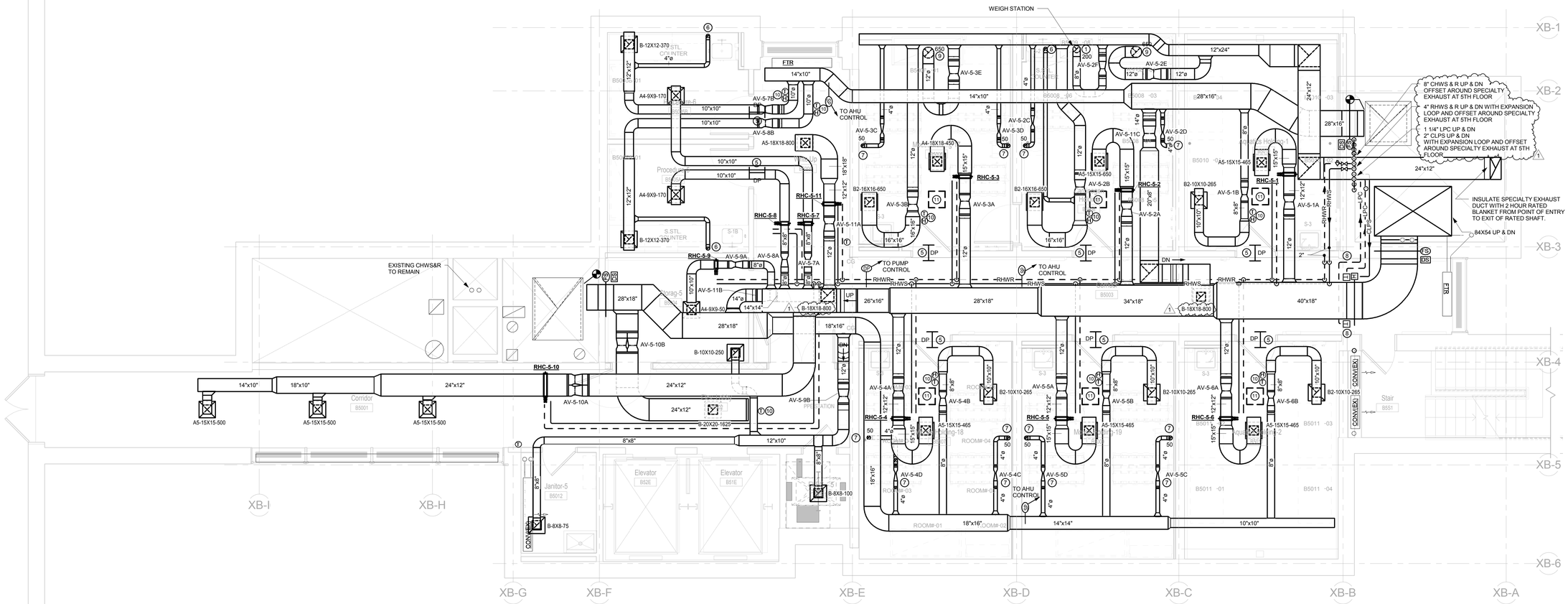

1 HVAC FIFTH FLOOR PLAN
1/4" = 1'-0"

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HVAC FIFTH FLOOR PLAN

Sheet

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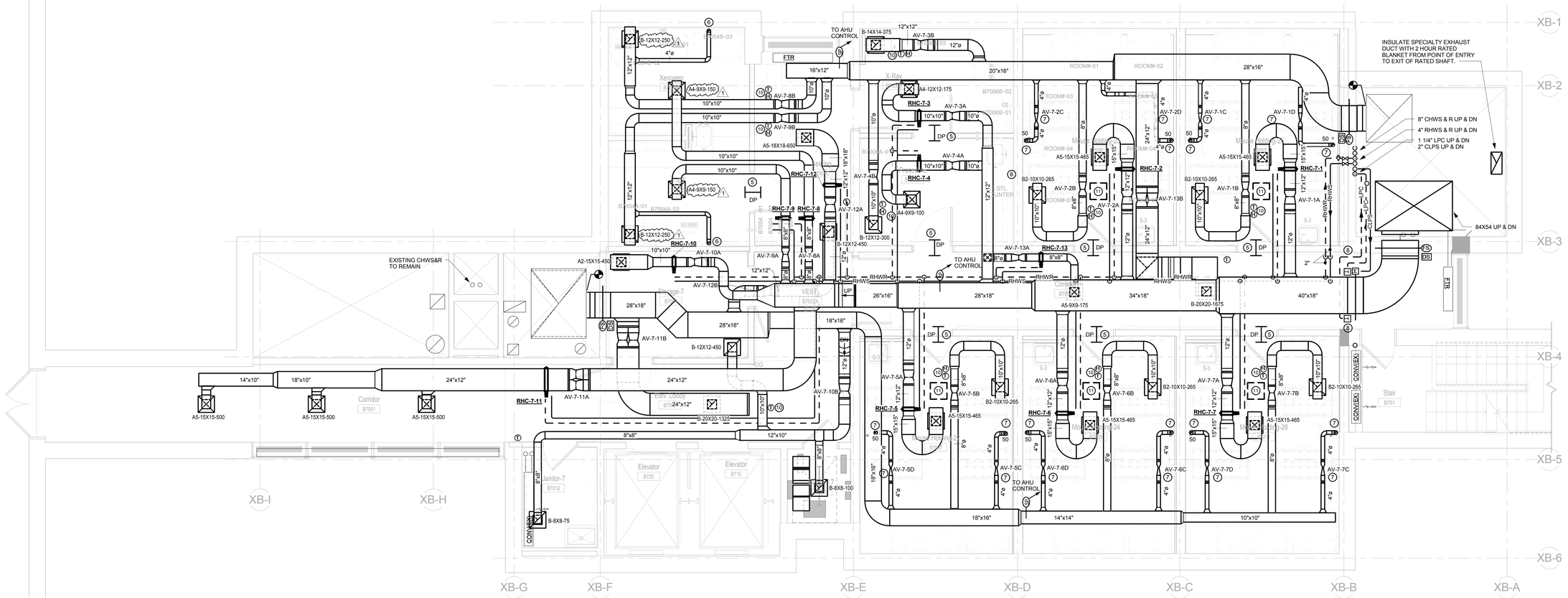

1 HVAC SEVENTH FLOOR PLAN
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HVAC SEVENTH FLOOR PLAN

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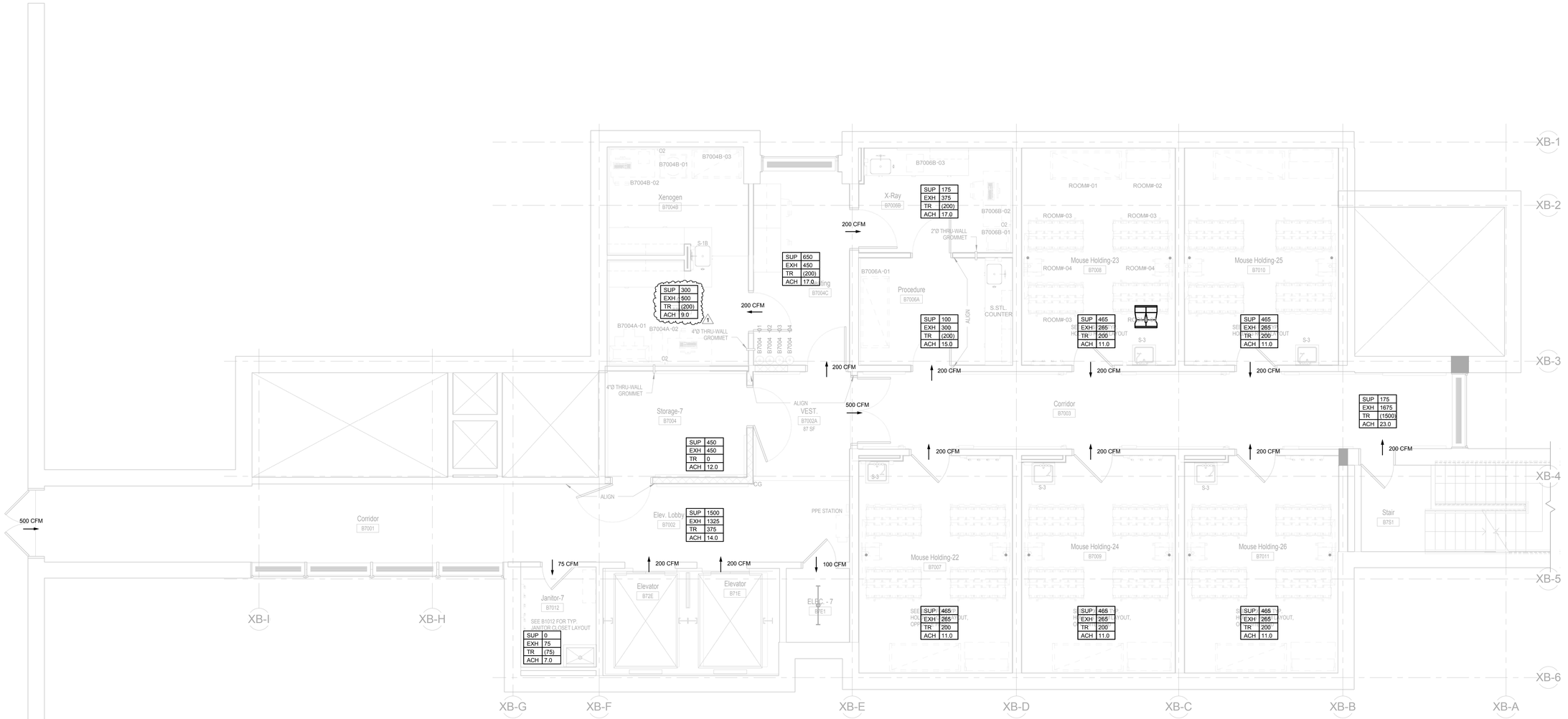

1 HVAC SEVENTH FLOOR PLAN
1/4" = 1'-0"

LEGEND

SUP	450	TOTAL ROOM SUPPLY CFM
EXH	550	TOTAL ROOM EXHAUST CFM
TR	(200)	NET ROOM TRANSFER (SUPPLY TO EXHAUST DIFFERENTIAL) CFM, PLUS (OR MINUS)
ACH	14	ACTUAL AIR CHANGES/HOUR BASED UPON EITHER TOTAL SUPPLY OR EXHAUST CFM, WHICHEVER IS GREATER

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ADDENDUM B

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HVAC ROOM AIRFLOW & PRESSURIZATION SEVENTH FLOOR PLAN

Sheet

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NOTE:
REFER TO MEP DRAWINGS FOR ADDITIONAL INFORMATION

COMMON REQUIREMENTS FOR SEQUENCES OF OPERATIONS

1. ALL SETPOINTS SHALL BE PROGRAMMED ADJUSTABLE AT THE OPERATOR WORKSTATION.
2. ALL HIGH AND LOW LIMITS SHALL BE ALARMED.
3. ALL COOLING COILS LOCATED IN OR OVER OCCUPIED SPACES SHALL HAVE A CONDENSATE PAN HIGH LEVEL ALARM.
4. ALL HYDRONIC PROOF OF FLOW SHALL BE VIA CURRENT SENSORS.
5. ALL FAN PROOF OF OPERATION SHALL BE HIGH AND LOW CURRENT SENSORS.
6. ALL UNIT SMOKE DETECTION, FREEZE PROTECTION, HIGH CONDENSATE LEVEL EMERGENCY SHUTDOWN/HIGH/LOW LIMIT AND/OR OTHER PROTECTIVE DEVICES SHALL BE DONE BY HARDENED RELAY INTERLOCK WITH LOCAL MANUAL RESET AND SHALL NOT RELY ON CONTROL SYSTEM PROGRAMMING.
7. ALL DAMPERS SHALL HAVE OPEN AND CLOSED STATUS INDICATION THROUGH END SWITCHES OR INTEGRAM ACTUATOR FEATURE.
8. ALL DAMPERS SHALL HAVE AN INDEPENDENT CONTROL POINT. MULTIPLE DAMPERS OF DIFFERENT APPLICATIONS (I.E., OUTDOOR, RETURN, RELIEF) CONTROLLED FROM A SINGLE POINT ARE NOT ACCEPTABLE.
9. ALL AIR HANDLING SYSTEMS WITH DUCTED OUTDOOR AIR SHALL BE PROVIDED WITH FREEEZE PROTECTION.

NOTE: THE FOLLOWING ARE 2007 ASHRAE 90.1 MANDATORY PROVISIONS REQUIRED.

10. ALL ZONES SHALL BE THERMOSTATICALLY CONTROLLED RESPONDING TO TEMPERATURE WITHIN THE ZONE AT A MINIMUM.
11. WHERE THERMOSTATIC ZONE CONTROLS ARE USED FOR BOTH HEATING AND COOLING, CONTROL SHALL BE CAPABLE OF PROVIDING A TEMPERATURE RANGE OR DEAD BAND OF AT LEAST 5 DEGREES FAHRENHEIT WHERE HEATING/COOLING IS AT MINIMUM OR SHUTOFF. EXCEPT FOR SPECIAL OCCUPANCIES SUCH AS ANIMAL HOLDING AND SUPPORT FUNCTION SPACES WHICH SHALL HAVE DEADBAND OF 4 DEGREES FAHRENHEIT (ADJ) WHERE STRICT TEMPERATURE/HUMIDITY CONTROL IS REQUIRED.
12. ALL ZONES WITH SEPARATE HEATING AND COOLING CONTROL SHALL HAVE SETPOINT OVERLAP RESTRICTION TO PREVENT SIMULTANEOUS HEATING AND COOLING.
13. OPTIMUM START CONTROL FOR ALL SYSTEMS TO MINIMIZE DEMAND LOAD. STAGGER START ALL MOTORIZED EQUIPMENT
14. ALL OUTDOOR SUPPLY AND EXHAUST/RELIEF VENTS SHALL HAVE LOW LEAKAGE MOTORIZED DAMPERS WITH SHUTOFF CONTROLS.

NOTE: THE FOLLOWING ARE 2007 ASHRAE 90.1 PRESCRIPTIVE PATH PROVISIONS REQUIRED.

15. ALL SYSTEMS >135,000 BTUH SHALL HAVE AIR OR WATERSIDE ECONOMIZER AND CONTROL
16. ZONE THERMOSTATIC CONTROLS SHALL PREVENT REHEATING, RECOOLING OR SIMULTANEOUS HEATING/COOLING EXCEPT AS ALLOWED PER ASHRAE 90.1-6.5.2.1.
17. VARIABLE AIR VOLUME STATIC PRESSURE SENSOR SHALL BE LOCATED SUCH THAT SETPOINT IS NO GREATER THAN ONE-THIRD THE TOTAL DESIGN FAN SPEED, EXCEPT WHEN SPEED SETPOINT IS RESET.
18. ALL VARIABLE VOLUME AIR SYSTEMS WITH VAV BOXES/AIR CONTROL VALVES SHALL HAVE STATIC PRESSURE SETPOINT RESET CONTROL LOWERING SETPOINT UNTIL ONE AIR VALVE IS NEARLY 100% OPEN.
19. ALL VARIABLE VOLUME WATER SYSTEMS SHALL BE CONTROLLED FROM DP SENSORS LOCATED AT E ND OF DISTRIBUTION SYSTEM WHERE MULTIPLE SENSORS ARE REQUIRED, CONTROL TO SENSOR FARTHEST FROM SETPOINT.

MISCELLANEOUS MONITORING POINTS

GENERAL
1.SEQUENCE OF OPERATION
a. MONITOR LOCAL CONTACTS OF MISCELLANEOUS EQUIPMENT PACKAGED CONTROLS FOR DIGITAL AND ANALOG INFORMATION. VERIFY DRY OR POWERED STATUS OF LOCAL CONTACT IN FIELD.
b. PROVIDE SENSORS AND/OR TRANSMITTERS FOR ANY INFORMATION NOTED BELOW THAT IS NOT AVAILABLE THROUGH PACKAGED CONTROLS.

2. ALARMS
a. PACKAGED CONTROL SYSTEM OUTPUT ALARMS.
b. AS NOTED.

3. METERING
a. SEE DWG MEP-201 FOR ADDITIONAL INFORMATION AND SYSTEMS TO BE METERED.

4. USER HEAD END PROGRAMMING INTERFACE:
PROVIDE SELECTED ROOM HVAC AND ELECTRICAL LIGHTING CONTROL POINTS GRAPHICS AND PROGRAMMING ON EXISTING USER HEAD END LOCATED IN ASSISTANT MANAGER OFFICE OF BUILDING "L" BASEMENT LEVEL TO ALLOW USER GROUP TO MONITOR AND ADJUST SELECTED CONTROL POINTS, SET HVAC AND LIGHTING MODES. COORDINATE WITH OWNER IN FIELD.

1 DOMESTIC WATER METERS (CW SERVICE)
1. SEQUENCE OF OPERATION
a. DOMESTIC COLD WATER FLOW TO BE MONITORED BY BAS

DOMESTIC WATER HEATERS AND RECIRCULATING PUMPS
1. SEQUENCE OF OPERATION
a. ENABLE WATER HEATERS ON/OFF TO OCCUPIED/UNOCCUPIED SCHEDULE.
b. MONITOR DOMESTIC HOT WATER SUPPLY TEMPERATURE FOR EACH HEATER.
c. MONITOR ON/OFF OPERATING STATUS FOR EACH HEATER.
d. MONITOR OPERATING STATUS OF EACH RECIRC PUMP
e. MONITOR SYSTEM TOTAL CONDENSATE FLOW AND CALCULATE/TOTALIZE BTUS AND FLOW.

2. ALARMS
a. HIGH HOT WATER SUPPLY TEMPERATURE.
b. LOW HOT WATER SUPPLY TEMPERATURE.
c. RECIRC. PUMP FAILURE.
d. GENERAL HEATER FAULT/FAILURE.

3. GRAPHICS
a. ALARM CONDITIONS.
b. HOT WATER SUPPLY TEMPERATURE.
c. RECIRC. PUMP STATUS.
d. CONDENSATE FLOW AND BTU TOTALIZATION

1 ELECTRICAL POWER SUB-METERING
1.SEQUENCE OF OPERATION
a. PROGRAM CENTRAL HEAD END TO MONITOR DATA, STATUS AND ALARMS AVAILABLE THROUGH NEW INTERFACE TO ELECTRICAL POWER PANEL METERING SYSTEM.
b. TOTALIZE POWER CONSUMPTION ON DAILY, MONTHLY, AND YEARLY BASIS WITH REPORTING FOR EACH INDIVIDUAL PANEL/SWITCHBOARD/BRANCH CIRCUITS, AS INDICATED ON MEP METERING DRAWING.

2. ALARMS
a. GENERAL FAULT/FAILURE.

3. GRAPHICS
a. STATUS.
b. REAL TIME POWER DEMAND (BY PANEL, CATEGORY AND BLDG.)
c. DAILY PEAK DEMAND (BY PANEL, CATEGORY, AND BLDG.)
d. DAILY POWER CONSUMPTION (BY PANEL, CATEGORY, AND BLDG.)
e. PEAK POWER DEMAND FOR MONTH (BY PANEL, CATEGORY AND BLDG.)
f. MTD POWER CONSUMPTION (BY PANEL, CATEGORY AND BLDG.)
g. YTD POWER CONSUMPTION (BY PANEL, CATEGORY AND BLDG.)

LIGHTING CONTROL (EA NON-ANIMAL HOLDING/PUBLIC ZONE)
1.SEQUENCE OF OPERATION
a. MONITOR EACH ROOM OCCUPANCY SENSOR ZONE (SEE ELECTRICAL DRAWINGS) AND ENABLE HVAC SYSTEM CONTROL MODES AS INDICATED IN SEQUENCES.

2. ALARMS
a. LIGHTS ON DURING NIGHT MODE (EACH ROOM)

3. GRAPHICS
a. ZONE DAY/NIGHT MODE STATUS (EA ROOM)
b. DEFAULT DAY/NIGHT SCHEDULE TIMES
c. CUSTOM DAY/NIGHT SCHEDULE TIMES (EA ROOM)

LIGHTING CONTROL (EA ANIMAL HOLDING RM)
1. SEQUENCE OF OPERATION
a. ENABLE ROOM LIGHTING CONTROL RELAY (PER DWG) FOR DAY(ON)/NIGHT(OFF) MODE
b. WHEN IN NIGHT MODE, MONITOR PHOTO SENSOR (PER DIV.26) AND IF LIGHTING IS SENSED ON, ALARM.
c. EACH ROOM SCHEDULE SHALL BE CAPABLE TO BE INDEXED TO A DEFAULT SCHEDULE OR INDIVIDUAL CUSTOM SCHEDULE.

2. ALARMS
a. LIGHTS ON DURING NIGHT MODE (EACH ROOM)

3. GRAPHICS
a. ZONE DAY/NIGHT MODE STATUS (EA ROOM)
b. DEFAULT DAY/NIGHT SCHEDULE TIMES
c. CUSTOM DAY/NIGHT SCHEDULE TIMES (EA ROOM)

FREEZER/REFRIGERATORS
1. SEQUENCE OF OPERATION
1 a. MONITOR EACH FREEZER/REFRIGERATOR INDEPENDENTLY FOR GENERAL ALARM
2. ALARM
a. GENERAL FAILURE

3. GRAPHICS
a. EQUIPMENT ID #
b. ROOM LOCATION
c. ALARM CONDITION

HVAC CONTROLS LEGEND

CONTROL ABBREVIATIONS

BMS	CENTRAL BUILDING MANAGEMENT SYSTEM
C	COMMON
EA	EXHAUST AIR
MA	MIXED AIR
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTDOOR AIR
RA	RETURN AIR
SA	SUPPLY AIR
VFR	VARIABLE REFRIGERANT FLOW

CONTROL SYMBOLS

- 2-WAY CONTROL VALVE
- FS — FLOW SWITCH
- M — MOTORIZED DAMPER
- DA — DAMPER ACTUATOR
- DS — DUCT SMOKE DETECTOR
- VA — VALVE ACTUATOR
- VFC — VARIABLE FREQUENCY CONTROLLER
- AFS — AIR FLOW STATION
- AVERAGING SENSOR
- Sp — SWITCH PILOT LIGHT
- MT — MARK-TIME SWITCH
- SD — SMOKE DAMPER
- CS — COMBINATION FIRE/SMOKE DAMPER
- FM — FLOW METER
- AIDI — FIRE ALARM ADDRESSABLE INTERFACE DEVICE
- SPACE SENSOR/TRANSMITTER
- SENSOR/TRANSMITTER

AQ	AQUASTAT
AFS	AIR FLOW STATION
CS	CURRENT SENSOR
CO2 DA	CARBON DIOXIDE LEVEL DAMPER ACTUATOR
DP	DIFFERENTIAL PRESSURE
ES	END SWITCH
F	FAULT
H	HUMIDITY (RELATIVE)
L	LIQUID LEVEL
OCC	OCCUPANCY
P	PRESSURE
PS	PHOTO SENSOR
PN	POSITION
SPD	SPEED
SP	STATIC PRESSURE
S/S	START/STOP
ST	STATUS
T	TEMPERATURE
VA	VALUE ACTUATOR

- L — LOW LIMIT INDICATION
- H — HIGH LIMIT INDICATION
- O — OPEN POSITION INDICATION
- C — CLOSED POSITION INDICATION

INTERFACE

	INTERFACE
AI	ANALOG INPUT
AO	ANALOG OUTPUT
BAC	BACNET MS/TP LAN INTERFACE
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
HDW	HARDWIRE THRU RELAY
LEG	LEGACY INTERFACE
LON	LONWORKS INTERFACE
RS	MAPPED RS INTERFACE

NOTE : REFER TO PLANS & SPECIFICATIONS OF ALL TRADES FOR QUANTITIES & LOCATIONS

PLUMBING EQUIPMENT

DOM. WTR METER (EA)	FM DI	PULSE SIGNAL
DOM. HW. HEATERS (EA)	ST DI	ST DO OCC/UNOCC T DI
DOM. HW. RECIRC. PUMP (EA)	ST DI	
DOMESTIC WATER HEATER SYSTEM -	FM DI	PULSE SIGNAL
RO SYSTEM	ST DI	
LAB OXYGEN SYSTEM	ST DI	
LAB CO2 SYSTEM	ST DI	

ELECTRICAL EQUIPMENT

FIRE ALARM	ST DI
ELECTRICAL POWER SUB-METERING SYSTEM	BAC
AUTOMATIC TRANSFER SWITCHES (EA)	ST DI
LIGHTING CONTROL (EACH ANIMAL HOLDING)	S/S DO PS DI
LIGHTING CONTROL (EACH NON-ANIMAL HOLDING/PUBLIC)	OCC DO OCC/UNCC

OWNER'S EQUIPMENT

FREEZER/REFRIGERATOR (EA)	ST DI

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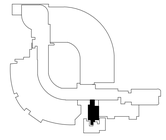

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HVAC CONTROLS

Sheet

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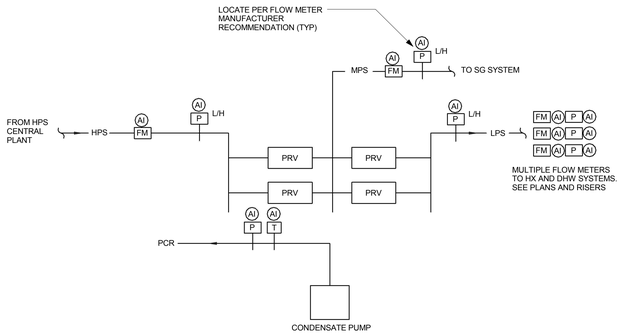


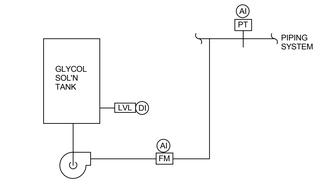
STEAM AND CONDENSATE SERVICE CONTROL

NOT TO SCALE

STEAM AND CONDENSATE SERVICE

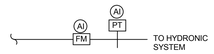
1. SEQUENCE OF OPERATION
   - A. MONITOR FLOW, TEMPERATURE, AND PRESSURE OF SYSTEMS
2. ALARMS
   - A. LOW/HIGH MPS PRESSURE
   - B. LOW/HIGH LPS PRESSURE
3. GRAPHICS
   - A. ALARM CONDITIONS
   - B. STEAM PRESSURE FOR EACH SG,DHW, HX SYSTEM
   - C. STEAM FLOW FOR EACH SG,DHW, HX SYSTEM
   - D. MPS BTU TOTALIZATION
   - E. PUMPED CONDENSATE PRESSURE
   - F. PUMPED CONDENSATE TEMPERATURE

1 H Details - STEAM AND CONDENSATE SERVICE CONTROL (HUMIDIFIER)
NOT TO SCALE



TYPICAL GLYCOL FEED SYSTEM CONTROL

NOT TO SCALE



TYPICAL HYDRONIC FILL CONTROL

NOT TO SCALE

GLYCOL FILL SYSTEM CONTROL

1. SEQUENCE OF OPERATION
   - a. THE PACKAGES CONTROLLER SHALL CYCLE THE PUMP TO MAINTAIN SYSTEM FILL PRESSURE.
2. ALARMS
   - a. LOW GLYCOL IN RESERVE TANK
   - b. EXCESSIVE FLOW
3. GRAPHICS
   - a. ALARM CONDITIONS
   - b. GLYCOL SOLUTION FLOW
   - c. GLYCOL SOLUTION FLOW TOTALIZATION

TYPICAL HYDRONIC FILL CONTROL

1. SEQUENCE OF OPERATION
   - a. SYSTEM FILL PRESSURE IS MANUALLY SET IN FIELD
4. ALARMS
   - c. EXCESSIVE FLOW
5. GRAPHICS
   - d. ALARM CONDITIONS
   - e. FILL WATER FLOW
   - f. FILL WATER FLOW TOTALIZATION

NOTE:
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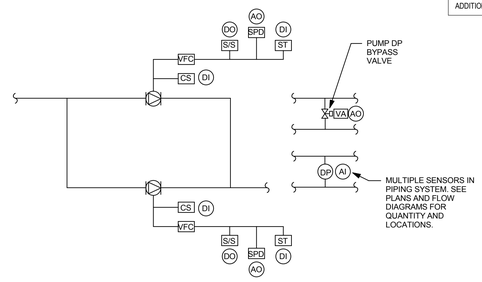
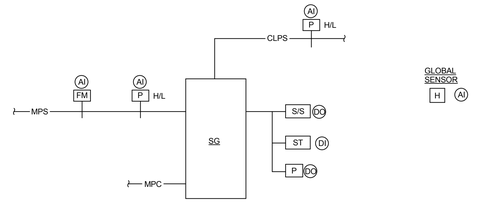


TYPICAL VARIABLE SPEED LEAD/LAG PUMP CONTROL

NOT TO SCALE

VARIABLE SPEED LEAD/LAG CONTROL

1. SEQUENCE OF OPERATION
   - a. HEATING PUMPS SHALL BE ENABLED YEAR ROUND. WHENEVER AT LEAST ONE HEATING VALVE IS COMMANDED TO ANY OPEN PERCENTAGE. WHEN ALL BUILDING HEATING VALVES ARE COMMANDED CLOSED THE SYSTEM SHALL BE DISABLED.
   - b. THE LEAD PUMP SHALL BE SELECTED SWITCHING QUARTERLY.
   - c. UPON FAILURE OF THE LEAD PUMPS AS SENSED BY THE CURRENT TRANSFORMER OR FAILURE OF THE DRIVE IT SHALL SHUT DOWN AND THE LAG PUMP SHALL START AUTOMATICALLY.
   - d. PUMP SPEED SHALL BE VARIED AS REQUIRED TO MAINTAIN SYSTEM DIFFERENTIAL PRESSURE. IF MULTIPLE DIFFERENTIAL PRESSURE TRANSMITTERS ARE USED IN THE SYSTEM THE LOWEST CONSTANTLY POLLED PRESSURE SHALL BE USED.
   - e. WHENEVER THE VFC IS AT MINIMUM SPEED AND ALL DIFFERENTIAL PRESSURE SENSORS ARE ABOVE SETPOINT THE BY-PASS VALVE SHALL MODULATE OPEN TO MAINTAIN SETPOINT AT THE LOWEST SENSOR.
2. ALARMS
   - a. PUMP FAILURE
   - b. DRIVE FAILURE
   - c. SYSTEM FAILURE
3. GRAPHICS
   - a. ALARM CONDITIONS
   - b. SPEED COMMAND PERCENTAGE
   - c. PUMPS STATUSES
   - d. SYSTEM DIFFERENTIAL PRESSURE(S)
   - e. MANUAL LEAD/LAG SELECTION
   - f. MANUAL SYSTEM ENABLED/DISABLE
   - g. BYPASS VALVE COMMAND PERCENTAGE

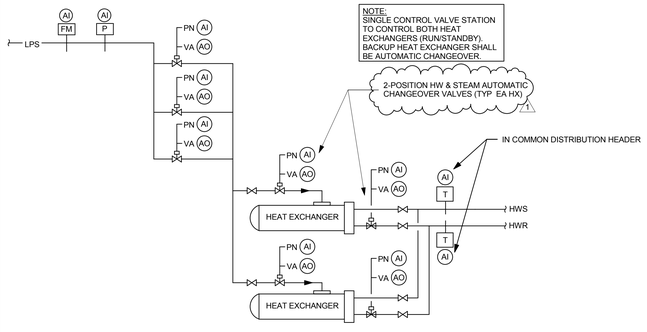


STEAM-FIRED CLEAN STEAM GENERATOR

NOT TO SCALE

UNFIRED STEAM GENERATOR

1. SEQUENCE OF OPERATION
   - a. THE UNIT SHALL BE ENABLED WHENEVER THE OUTSIDE AIR DEW POINT IS BELOW 50 DEGREES F (ADJ).
   - b. ONCE ENABLED THE FACTORY CONTROLS SHALL ACCOMPLISH FUNCTIONS INCLUDING STEAM VALVE CONTROL FOR PRESSURE, FILL/MAKE-UP CONTROL, MONITOR, ETC..
   - c. MONITOR SYSTEM INLET STEAM FLOW AND CALCULATE/TOTALIZE BTUs AND FLOW.
   - d. MONITOR SYSTEM INLET STEAM AND CLPS PRESSURE. UPON LOSS OF STEAM PRESSURE, DISABLE ALL HUMIDIFIERS. MANUAL RESTART UPON STEAM PRESSURE BEING RESTORED.
2. ALARMS
   - a. UNIT ALARM
3. GRAPHICS
   - a. ALARM CONDITION
   - b. START/STOP
   - c. STATUS
   - d. BLOW-DOWN OPERATING
   - e. OPERATING PRESSURE SETPOINT
   - f. CLPS PRESSURE
   - g. OUTSIDE AIR DEW POINT



TYPICAL STEAM TO WATER HEAT EXCHANGER CONTROL

NOT TO SCALE

TYPICAL STEAM TO WATER HEAT EXCHANGERS

1. SEQUENCE OF OPERATION
   - a. THE HEAT EXCHANGER SEQUENCE SHALL BE ENABLED WHENEVER ITS ASSOCIATED SYSTEM PUMPS ARE ENABLED AND OPERATION IS PROVEN.
   - b. THE THREE 1/3 VALVES SHALL MODULATE IN SEQUENCE TO MAINTAIN DISCHARGE WATER TEMPERATURE SETPOINT. VALVE FAIL POSITION SHALL BE CLOSED.
   - c. DISCHARGE WATER SETPOINT SHALL BE RESET BASED ON OUTSIDE AIR TEMPERATURE FROM 180 DEGREES F (ADJ) AT 35 DEGREES F OUTSIDE AIR TO 140 DEGREES F (ADJ) AT 55 DEGREES F OUTSIDE AIR.
   - d. VALVE SEQUENCING OF FIRST, SECOND AND THIRD SHALL BE ROTATED AUTOMATICALLY ONCE PER YEAR.
   - e. AUTOMATICALLY ROTATE LEAD HEAT EXCHANGER TWO TIMES PER YEAR, AND UPON MANUAL COMMAND FROM WORKSTATION BY OPENING/CLOSING STEAM AND HOT WATER RETURN HEAT EXCHANGER MOTORIZED ISOLATION VALVES.
   - f. MONITOR SYSTEM TOTAL STEAM FLOW AND CALCULATE/TOTALIZE BTUs AND FLOW.
2. ALARMS
   - a. LOW DISCHARGE WATER TEMPERATURE
   - b. HIGH DISCHARGE WATER TEMPERATURE
3. GRAPHICS
   - a. ALARM CONDITIONS
   - b. SYSTEM STATUS: ENABLED/DISABLED
   - c. VALVE COMMAND PERCENTAGES
   - d. FIRST, SECOND, THIRD VALVE SEQUENCE
   - e. HOT WATER SUPPLY TEMPERATURE SETPOINT
   - f. HOT WATER SUPPLY TEMPERATURE
   - g. HOT WATER RETURN TEMPERATURE
   - h. HOT WATER SUPPLY FLOW
   - i. HOT WATER RETURN AUTO-CHANGEOVER VALVE COMMAND (EA HX)
   - j. HOT WATER RETURN AUTO-CHANGEOVER VALVE POSITION (EA HX)
   - k. STEAM AUTO-CHANGEOVER VALVE COMMAND (EA HX)
   - l. STEAM AUTO-CHANGEOVER VALVE POSITION (EA HX)

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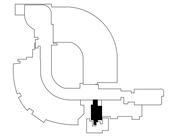

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HVAC CONTROLS

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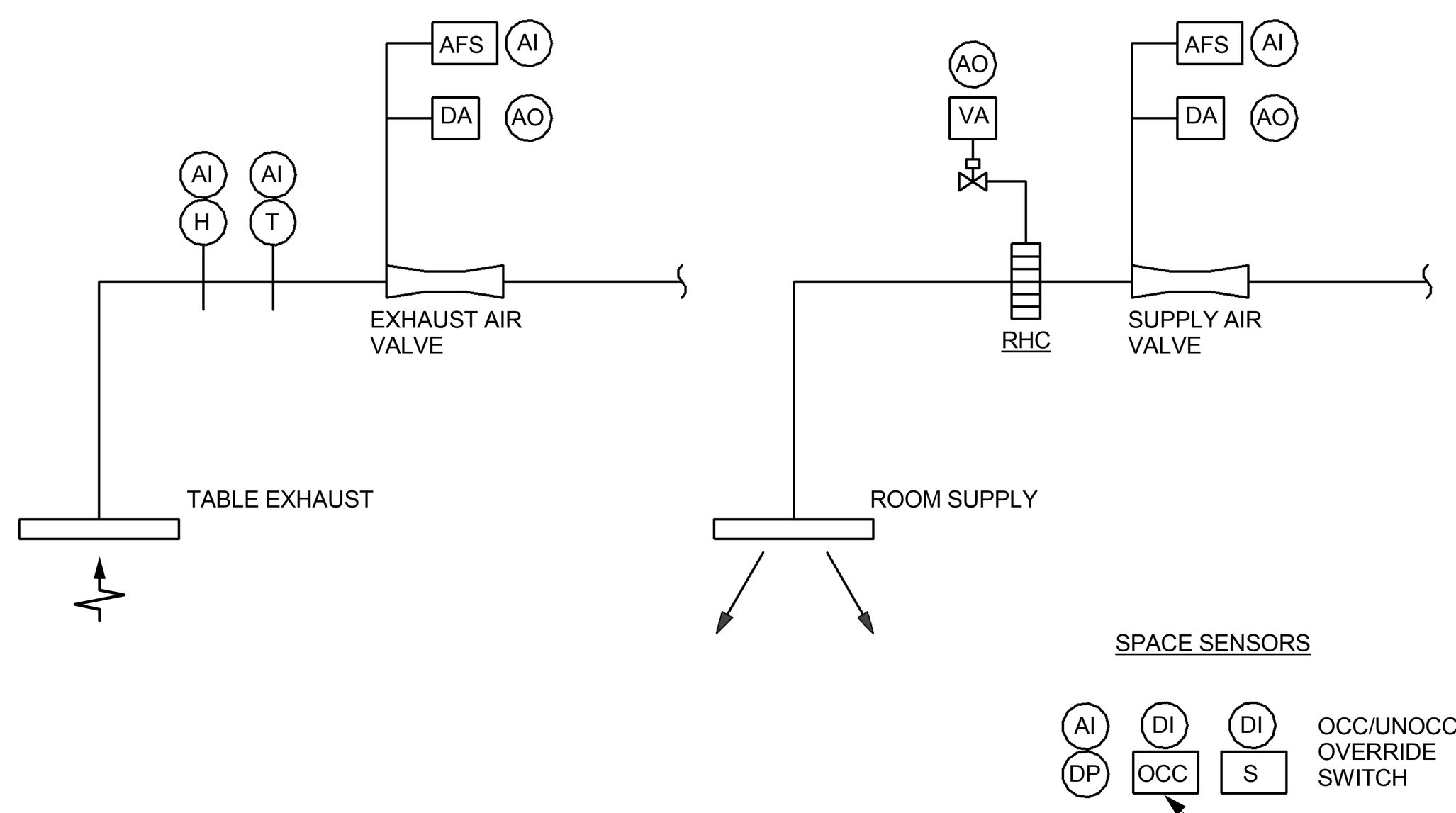


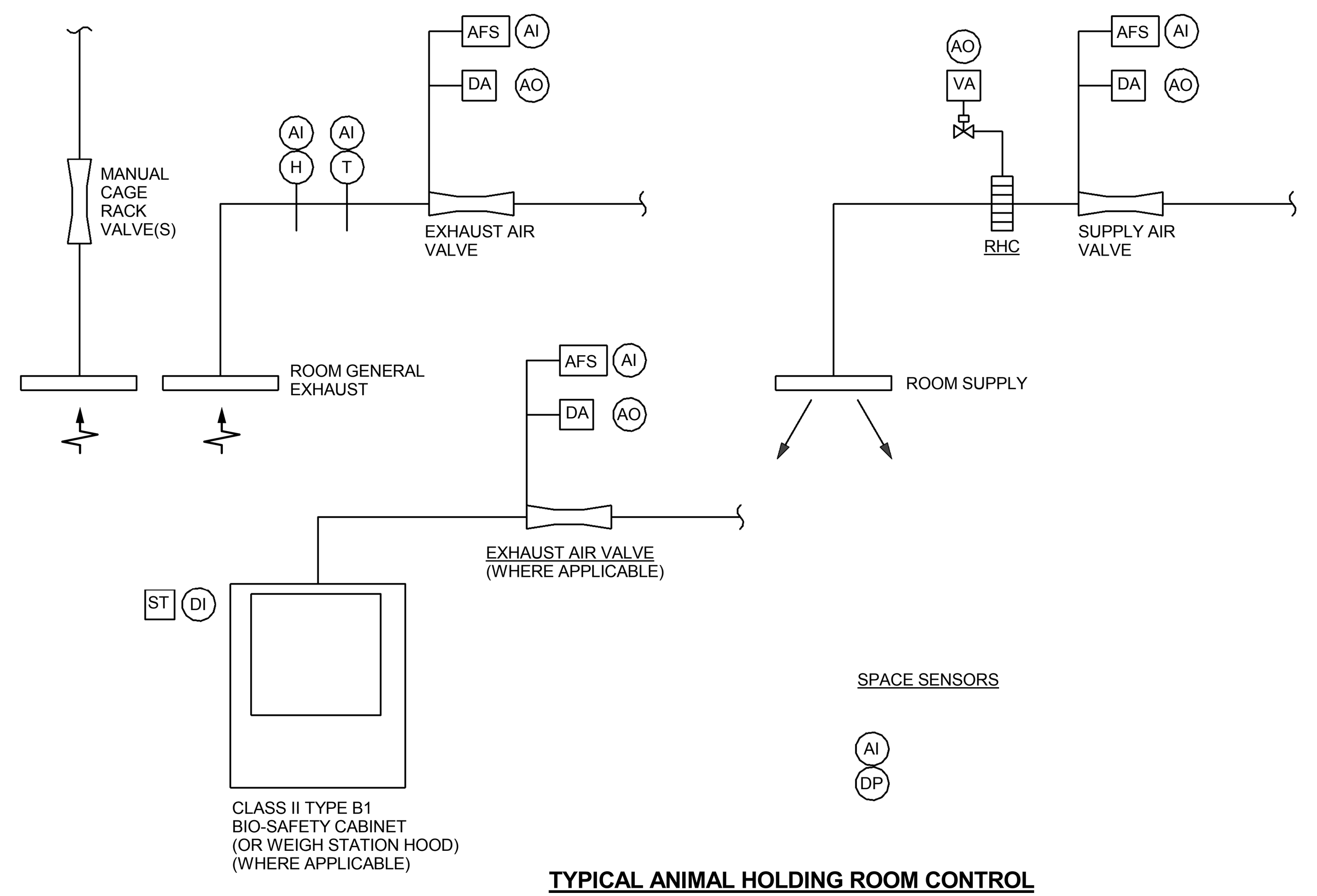
NECROPSY LAB WITH TABLE EXHAUST CONTROL

NOT TO SCALE

1. SEQUENCE OF OPERATION:
   A. TWO MODES OF OPERATION "STANDBY" AND "IN -USE" SHALL BE ENABLED AUTOMATICALLY AND MANUALLY THROUGH BMS. NORMAL MODE SHALL BE "STANDBY".
   B. "IN-USE" MODE SHALL BE ESTABLISHED WHEN ANY OF FOLLOWING ROOM OCC/UNOCC OVERRIDE SWITCH ENABLED OR WHEN THE SPACE OCCUPANCY SENSOR HAS BEEN ACTIVATED OR AS SCHEDULED BY OPERATOR WORKSTATION.
   C. MAINTAIN MAX CFM FOR SUPPLY AND EXHAUST WHEN ROOM IS "IN-USE". MODULATE REHEAT VALVE TO MAINTAIN ROOM TEMPERATURE SETPOINT OF 72°F (ADJ). REHEAT VALVE FAIL POSITION IS CLOSED.
   D. "STANDBY" MODE: SET BACK TEMPERATURE TO 65°F HTG/78°F CLG (ADJ) SETPOINT AND MINIMUM CFM SETPOINT DURING "STANDBY" MODE, BUT NEVER BELOW 4 AIR CHANGES PER HOUR. ALWAYS MAINTAIN ROOM OFFSET CFM.
   E. MONITOR ROOM HUMIDITY. DO NOT INCLUDE IN AVERAGE FOR HUMIDIFIER CONTROL.
   F. MONITOR ROOM DIFFERENTIAL PRESSURE AND ALARM WITH AFTER 60 SEC. DELAY.

2. ALARMS:
   A. LOW/HIGH AIR VOLUME FOR SUPPLY EXHAUST OR GENERAL EXHAUST
   B. LOW/HIGH AIR VELOCITY AT HOOD
   C. LOW/HIGH SPACE TEMPERATURE
   D. ROOM DIFFERENTIAL PRESSURE

3. GRAPHICS:
   A. ALARM CONDITIONS
   B. "STANDBY"/"IN-USE" MODE INDICATION
   C. OFFSET AIR VOLUME SETPOINT & ACTUAL
   D. ROOM TEMPERATURE SETPOINT
   E. ROOM TEMPERATURE
   F. ROOM HUMIDITY
   G. ROOM DIFFERENTIAL PRESSURE
   H. DISCHARGE AIR TEMPERATURE SETPOINT
   I. DISCHARGE AIR TEMPERATURE
   J. SUPPLY AIR VOLUME SETPOINT AND ACTUAL
   K. GENERAL EXHAUST AIR VOLUME SETPOINT AND ACTUAL



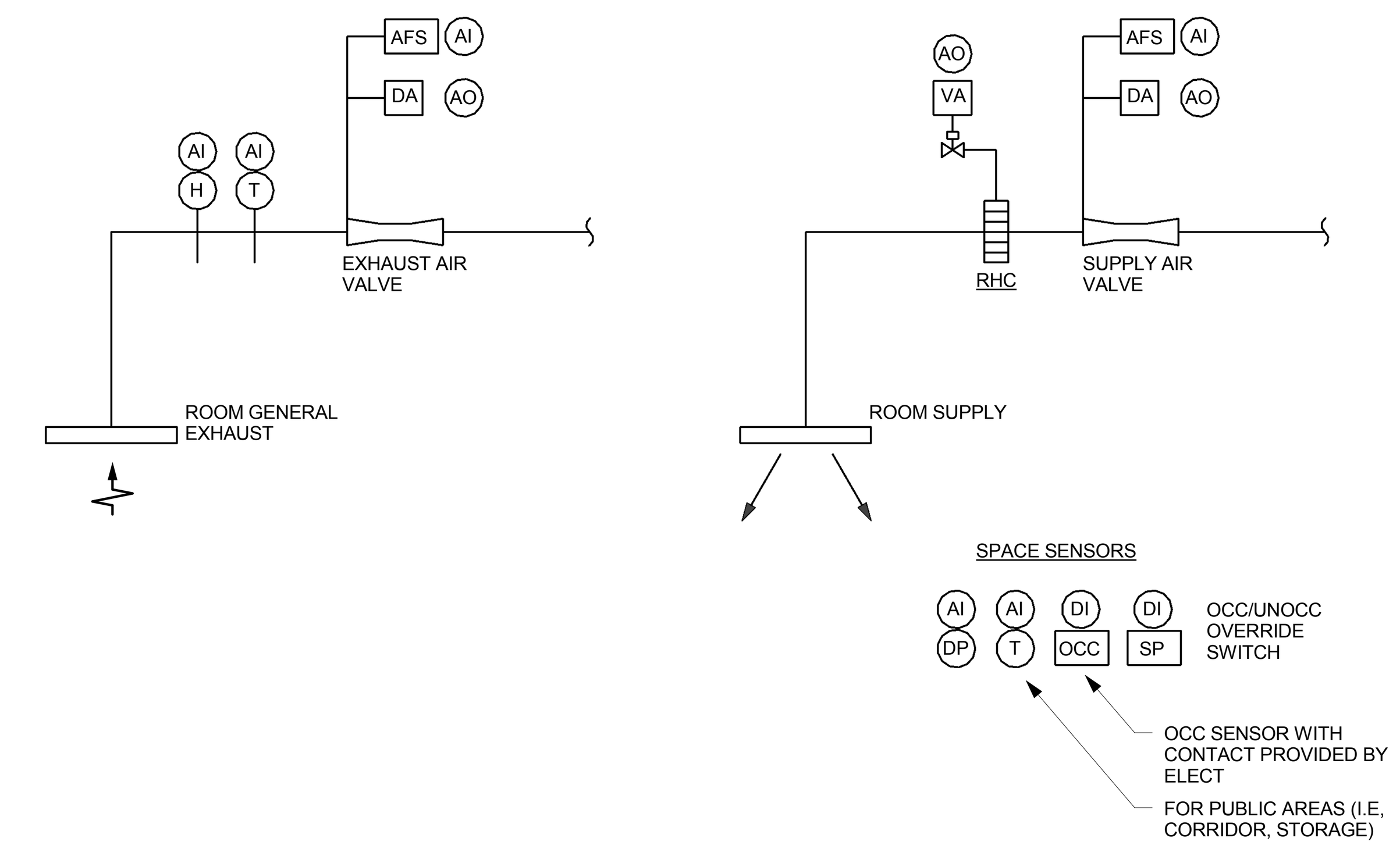
TYPICAL ANIMAL HOLDING ROOM CONTROL

NOT TO SCALE

1. SEQUENCE OF OPERATION:
   A. THREE MODES OF OPERATION SHALL BE MANUALLY ENABLED THROUGH BMS AT USER HEADEND WORKSTATION IN CAGEWASH: "IN USE", "STANDBY" AND "DECONTAMINATION". NORMAL MODE SHALL BE "IN-USE".
   B. ON/OFF SWITCH ON EACH BSC/HOOD SHALL ENABLE AIR VALVE FROM MIN (OFF) TO MAX (CFM).
   C. "IN USE" MODE: THE SUPPLY AIR VALVE SHALL MODULATE FROM MIN TO MAX CFM TO MAINTAIN SPACE TEMPERATURE 72°F (ADJ) AND SHALL USE CURRENT BSC/HOOD AND GENERAL EXHAUST AIR VOLUME AS A MINIMUM AIR VOLUME SETPOINT BUT SHALL NEVER GO BELOW CFM REQUIRED TO MAINTAIN ROOM CFM OFFSET. ON A FURTHER DROP IN TEMPERATURE BELOW SETPOINT WHEN THE VALVE IS ALREADY AT MINIMUM THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE. A GENERAL EXHAUST VALVE SHALL MODULATE TO MAINTAIN ROOM AIR VOLUME OFFSET PER HVAC AIRFLOW & PRESSURIZATION PLANS.
   D. "STANDBY" MODE: THE SUPPLY AIR VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE BETWEEN MIN 68°F (ADJ) AND MAX 78°F (ADJ) AND SHALL USE CURRENT BSC/HOOD AND GENERAL EXHAUST AIR VOLUME AS A MINIMUM AIR VOLUME SETPOINT BUT SHALL NEVER GO BELOW CFM REQUIRED TO MAINTAIN ROOM CFM OFFSET. ON A FURTHER DROP IN TEMPERATURE BELOW SETPOINT WHEN THE AIR VALVE IS ALREADY AT MINIMUM THE REHEAT COIL VALVE SHALL MODULATE TO MAINTAIN OFFSET SPACE TEMPERATURES. A GENERAL EXHAUST VALVE SHALL MODULATE TO MAINTAIN ROOM AIR VOLUME OFFSET PER HVAC AIRFLOW & PRESSURIZATION PLANS.
   E. "DECONTAMINATION" MODE: ALL VALVES SHALL BE CLOSED. REHEAT COIL VALVE SHALL BE CLOSED. DISABLE DP MONITORING.
   F. MONITOR ROOM HUMIDITY AND SIGNAL HUMIDIFIER CONTROL.
   G. MONITOR ROOM DIFFERENTIAL PRESSURE AND ALARM AFTER 60 SEC. DELAY.

2. ALARMS:
   A. LOW/HIGH AIR VOLUME FOR SUPPLY, HOOD EXHAUST OR GENERAL EXHAUST
   B. LOW/HIGH AIR VELOCITY AT HOOD
   C. LOW/HIGH SPACE TEMPERATURE

3. GRAPHICS:
   A. ALARM CONDITIONS
   B. IN USE, STANDBY, DECONTAMINATION MODE INDICATION
   C. OFFSET AIR VOLUME SETPOINT & ACTUAL
   D. ROOM TEMPERATURE SETPOINT
   E. ROOM TEMPERATURE
   F. ROOM HUMIDITY
   G. BSC/HOOD EXHAUST AIR VOLUME SETPOINT AND ACTUAL (EA)
   H. SUPPLY AIR VOLUME SETPOINT AND ACTUAL
   I. GENERAL EXHAUST AIR VOLUME SETPOINT AND ACTUAL



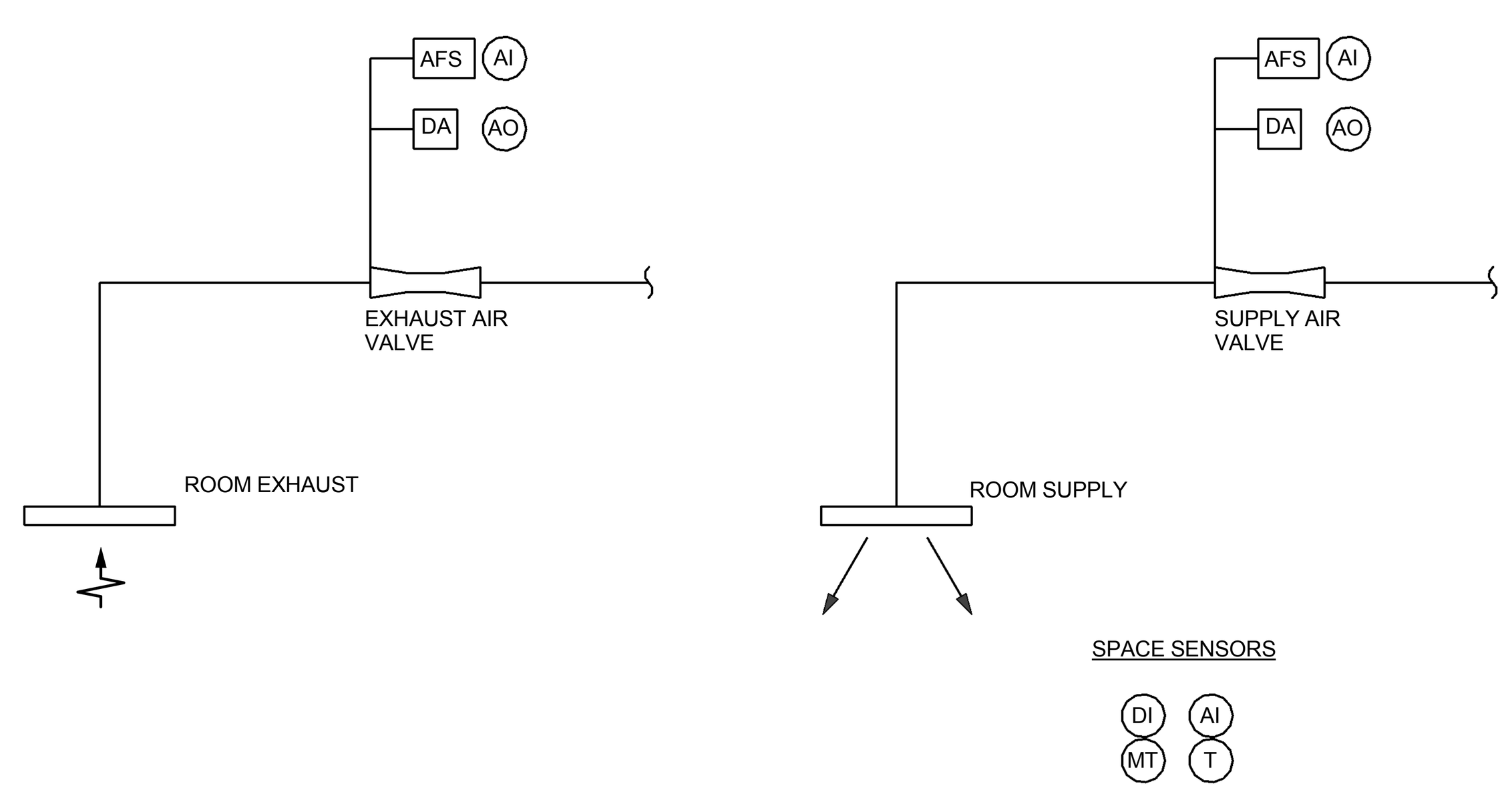
TYPICAL NON-ANIMAL HOLDING ROOMS/PUBLIC CORRIDOR CONTROL

NOT TO SCALE

1. SEQUENCE OF OPERATION:
   A. TWO MODES OF OPERATION, "STANDBY" AND "IN-USE", SHALL BE ENABLED AUTOMATICALLY AND MANUALLY THROUGH BMS. NORMAL MODE SHALL BE "STANDBY".
   B. "IN-USE" MODE SHALL BE ESTABLISHED WHEN ANY OF FOLLOWING ROOM OCC/UNOCC OVERRIDE SWITCH ENABLED OR WHEN THE SPACE OCCUPANCY SENSOR HAS BEEN ACTIVATED OR AS SCHEDULED BY OPERATOR WORKSTATION.
   C. MODULATE FROM MIN TO MAX CFM TO MAINTAIN ROOM SETPOINT WHILE MAINTAIN ROOM CFM OFFSET. MODULATE REHEAT VALVE TO MAINTAIN ROOM 72°F (ADJ) TEMPERATURE SETPOINT WHEN SUPPLY AIR VALVE AT MINIMUM. REHEAT VALVE FAIL POSITION IS CLOSED.
   D. "STANDBY" MODE: SETBACK TEMPERATURE TO 65°F HTG/78°F CLG (ADJ) AND MINIMUM CFM SETPOINT DURING "STANDBY" MODE BUT NEVER BELOW 4 AIR CHANGES AN HOUR (ADJ). ALWAYS MAINTAIN ROOM OFFSET CFM.
   E. MONITOR ROOM HUMIDITY. DO NOT INCLUDE IN AVERAGE FOR HUMIDIFIER CONTROL.
   F. MONITOR ROOM DIFFERENTIAL PRESSURE AND ALARM AFTER 60 SEC. DELAY.

2. ALARMS:
   A. LOW/HIGH AIR VOLUME FOR SUPPLY EXHAUST OR GENERAL EXHAUST
   B. LOW/HIGH AIR VELOCITY AT HOOD
   C. LOW/HIGH SPACE TEMPERATURE

3. GRAPHICS:
   A. ALARM CONDITIONS
   B. "STANDBY"/"IN-USE" MODE INDICATION
   C. OFFSET AIR VOLUME SETPOINT & ACTUAL
   D. ROOM TEMPERATURE SETPOINT
   E. ROOM TEMPERATURE
   F. ROOM HUMIDITY
   G. ROOM DIFFERENTIAL PRESSURE
   H. SUPPLY AIR VOLUME SETPOINT AND ACTUAL
   I. GENERAL EXHAUST AIR VOLUME SETPOINT AND ACTUAL



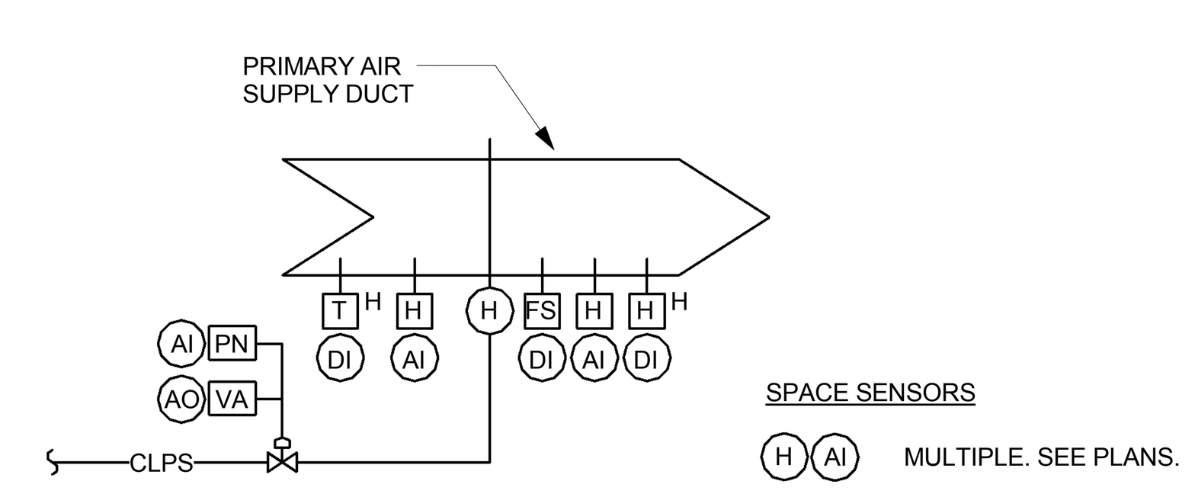
MECHANICAL EQUIPMENT ROOM CONTROL

NOT TO SCALE

1. SEQUENCE OF OPERATION:
   A. MODULATE SUPPLY AND EXHAUST AIR VALVES TO MAINTAIN SPACE TEMPERATURE SETPOINT.
   B. ACTUATE AIR VALVES TO MAXIMUM CFM POSITION UPON MANUAL INITIATION OF MARK TIME SWITCH AND RUN CONTINUOUSLY AT MAXIMUM CFM UNTIL LOSS OF MARK TIME SWITCH SIGNAL SUBJECT TO LOW ROOM TEMPERATURE LIMIT OF 65DEG F (ADJ).

2. ALARMS:
   A. LOW/HIGH AIR VOLUME FOR SUPPLY OR EXHAUST
   B. LOW/HIGH SPACE TEMPERATURE

3. GRAPHICS:
   A. ALARM CONDITIONS
   B. MARK TIME INITIATION INDICATION
   C. ROOM TEMPERATURE SETPOINT
   D. ROOM TEMPERATURE
   E. SUPPLY AIR VOLUME
   F. EXHAUST AIR VOLUME



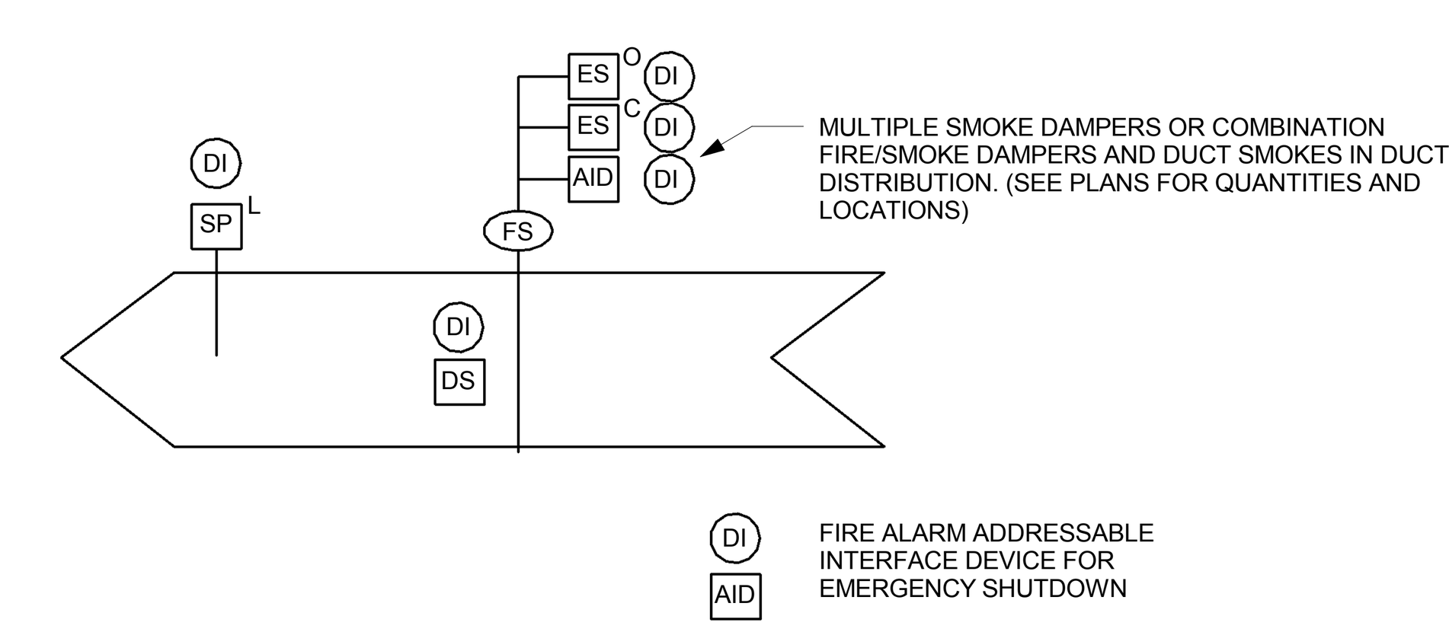
DUCT STEAM HUMIDIFIER CONTROL

NOT TO SCALE

1. SEQUENCE OF OPERATION
   A. MODULATE STEAM CONTROL VALVE TO MAINTAIN AVERAGE SPACE HUMIDITY LEVEL AT 40% RH (ADJ) IN ANIMAL HOLDING ROOMS, SUBJECT TO MODULATING HIGH LIMIT CONTROL. AVERAGE ONLY ANIMAL HOLDING LEVELS FOR HUMIDIFIER OPERATION.
   B CLOSE STEAM VALVE IN EVENT OF LOSS OF STEAM GENERATOR OR STEAM PRESSURE/ALARM OR DUCT COOLING, DELAY RESTART UNTIL ROOM CONDITIONS AND STEAM PRESSURE ARE RE-ESTABLISHED AND STABILIZE.

2. ALARMS
   A. HIGH DUCT HUMIDITY LIMIT
   B. HIGH DUCT TEMPERATURE

3. GRAPHICS
   A. ALARM CONDITIONS
   B. CLPS VALVE COMMAND
   C. CLPS VALVE POSITION
   D. ANIMAL ROOMS SPACE HUMIDITY AVERAGE
   E. HUMIDIFIER INLET HUMIDITY
   F. HUMIDIFIER OUTLET HUMIDITY



TYPICAL FIRE/SMOKE DAMPER

NOT TO SCALE

1. SEQUENCE OF OPERATION AND DAMPER CLOSES UPON SIGNAL FROM FIRE ALARM SYSTEM. MONITOR AT ATC:
   a. DAMPER CLOSES UPON SIGNAL FROM FIRE ALARM SYSTEM. MONITOR ALARM CONDITION AND DAMPER POSITION AT ATC HEAD END.

2. ALARMS:
   A. GENERAL FIRE ALARM CONDITION.
   B. DAMPER FAILURE IN NON ALARM AND ALARM CONDITIONS.

3. GRAPHICS:
   A. ALARM CONDITIONS
   B. DAMPER POSITION

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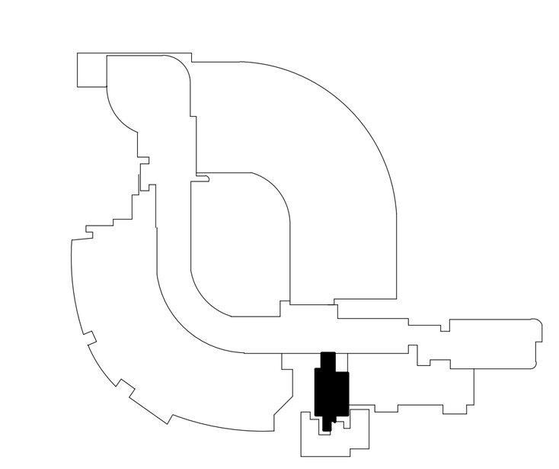

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HVAC CONTROLS

Sheet

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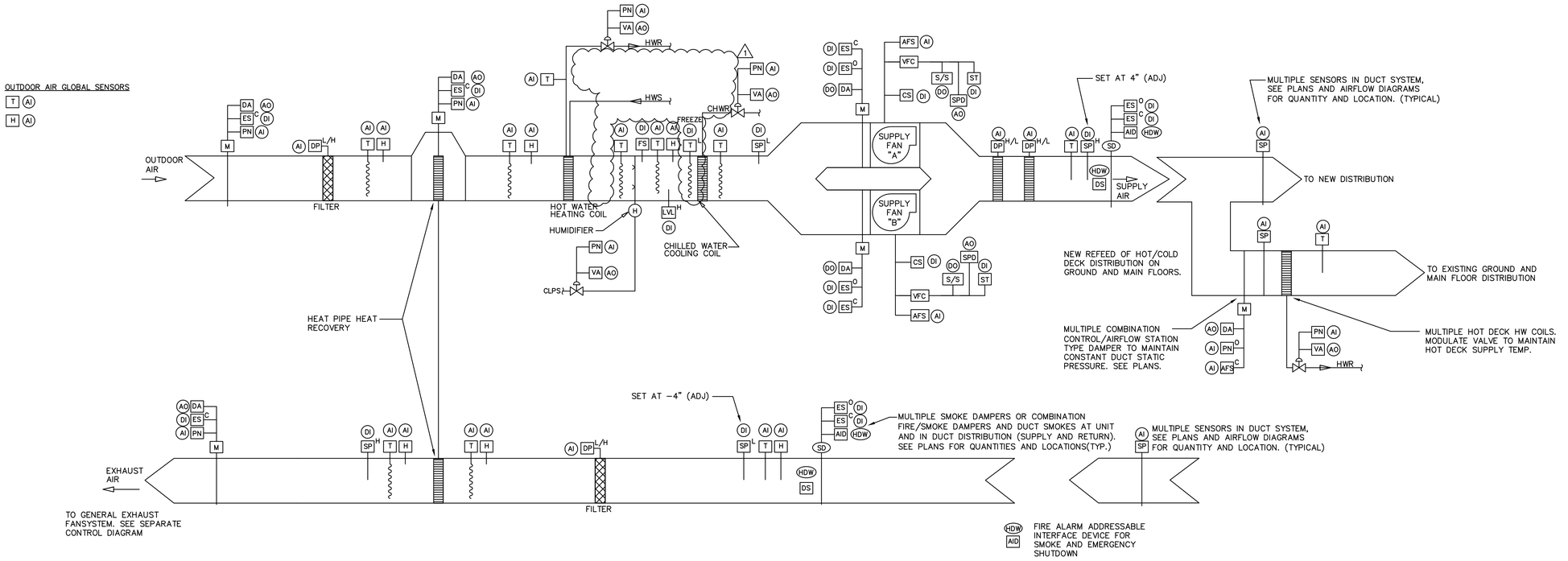

TYPICAL DUAL FAN CONTROL SCHEMATIC (AHU-1)
NOT TO SCALE

1. SEQUENCE OF OPERATION

A. GENERAL: VARIABLE VOLUME AIR HANDLING UNIT WITH SUPPLY FANS, HOT WATER HEATING AND CHILLED WATER COOLING COILS, HEAT RECOVERY, FILTRATION SERVING DUCT DISTRIBUTION OF VAV TERMINAL AIR VALVES WITH HOT WATER REHEAT COILS. SEQUENCE OF UNIT TO BE INTERLOCKED WITH EF1A–EF1D OPERATION.

B. OCCUPIED/DISABLE MODE:
a. UNIT SHALL OPERATE IN OCCUPPIED MODE 24/7, SUBJECT TO DISABLE AND SHUTDOWN COMMANDS.

C. DISABLED CONDITION: WHENEVER THE UNIT IS SHUTDOWN OR DISABLED FANS SHALL BE OFF, THE SUPPLY AND EXHAUST SMOKE DAMPERS ALL DAMPERS IN UNIT AND ASSOCIATED DUCT DISTRIBUTION SHALL BE CLOSED, OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL BE CLOSED. THE HEATING COIL VALVE SHALL MODULATE TO MAINTAIN AN INTERNAL CASE TEMPERATURE OF 50 DEGREES F (ADJ) AT THE HEATING COIL DISCHARGE AIR TEMPERATURE SENSOR. WHENEVER A SUPPLY/EXHAUST FAN IS STOPPED ITS DEDICATED ISOLATION DAMPER SHALL BE CLOSED. THE COOLING VALVES SHALL BE FULLY CLOSED WHEN THE UNIT IS OFF.

D. OPTIMAL START/DEMAND LIMITING CONTROL:
a. START COMMAND SHALL BE SEQUENCED SUBJECT TO THE CAMPUS OPTIMAL START AND DEMAND LIMITING CONTROL:
b. IN ANY EVENT WHERE MULTIPLE UNITS/EQUIPMENT ARE SHUTDOWN DOWN, SYSTEM SHALL SEQUENCE RESTART OF EQUIPMENT IN A MANNER TO MINIMIZE DEMAND, BEGINNING WITH STEAM, THEN HYDRONICS AND THEN FOLLOWED BY AIRSIDE EQUIPMENT AND CONSISTENT WITH UCHC CAMPUS DEMAND LIMITING SEQUENCE AND PROGRAMMING.
c. MOTORIZED EQUIPMENT SHALL BE STAGGER STARTED

E. STANDBY POWER MODE:
a. IN THE EVENT OF LOSS OF BOTH NORMAL AND STANDBY POWER, ALL SYSTEMS SHALL BE DISABLED.
b. DUAL SUPPLY FANS ARE POWERED FROM DIFFERENT BRANCHES OF POWER, ONE FAN FROM NORMAL POWER AND ONE FROM STANDBY. SYSTEM SHALL MONITOR STATUS OF BRANCH POWER. WITH LOSS OF EITHER BRANCH, FANS SHALL OPERATE AS INDICATED IN FAN CONTROL.

F. RESET/START COMMAND: WHEN THE SYSTEM IS STARTED OR RESET, COILS SHALL COME UNDER CONTROL FIRST, THEN SUPPLY AND EXHAUST AHU AND DUCT DISTRIBUTION SMOKE DAMPERS SHALL OPEN, SUPPLY/EXHAUST FAN ISOLATION DAMPERS SHALL OPEN AND, SUBJECT TO END SWITCHES ON THE DAMPER CLOSED POSITIONS THE FANS SHALL BE SENT A START COMMAND. SUPPLY AND EXHAUST FANS SHALL RAMP UP OVER 240 SECONDS (ADJ) WITH HEATING /COOLING COIL KEEPING PACE AND AT SETPOINT.

G. SINGLE FAN START/STOP: IF A SINGLE FAN FAILS OR IS SHUT DOWN MANUALLY IT SHALL BE COMPLETELY SHUT DOWN AND ITS DEDICATED ISOLATION DAMPER SHALL CLOSE. WHEN A SINGLE FAN IS RESTARTED WITH THE SYSTEM RUNNING IT SHALL BE ENABLED TO RAMP UP AS SOON AS ITS ISOLATION DAMPER LIFTS FROM THE CLOSED POSITION AND SHALL RAMP UP AS FAST AS PRUDENT TO PREVENT BACKSPIN. ONCE ITS SPEED IS WITHIN 10% OF THE SPEED OF THE FAN IN OPERATION BOTH FANS SHALL COME UNDER PARALLEL CONTROL.

H. STOP/SHUT-DOWN COMMAND: A UNIT SHUTDOWN SHALL OCCUR UNDER THE CONDITIONS INDICATED BELOW. THE SUPPLY AND EXHAUST FAN VARIABLE FREQUENCY CONTROLLERS SHALL RAMP DOWN TO MINIMUM SPEED IN 120 SECONDS (ADJ) AND COMMAND OFF. ALL EMERGENCY COMMANDS SHALL BE A HARD WIRE INTERLOCK THAT IMMEDIATELY DISCONNECTS POWER TO THE SUPPLY AND RETURN FANS AND IS ALARMED AT OPERATOR WORKSTATION. ONCE COMMANDED TO SHUTDOWN, THE UNIT SHALL GO TO DISABLED MODE. EACH EMERGENCY CONDITION SHUTDOWN REQUIRES A MANUAL RESET TO CLEAR ALARM AND ALLOW START OF UNIT, SUBJECT TO OPTIMUM / DEMAND LIMITING CONTROL SEQUENCE
a. EMERGENCY SMOKE CONDITION IN AHU SUPPLY OR EXHAUST DUCT DISTRIBUTION AS SENSED BY AHU/DUCT DISTRIBUTION SMOKE DETECTORS
b. EMERGENCY SHUTDOWN CONDITION AS COMMANDED FROM BUILDING FIRE ALARM SYSTEM FOR BOTH ALARM CONDITION IN ACCORDANCE WITH AHJ AND OWNER REQUIREMENTS AND FOR A MANUAL EMERGENCY SHUTDOWN COMMAND.
c. EMERGENCY SUPPLY FAN STATIC ALARM CONDITION (4" ADJ)
d. EMERGENCY EXHAUST FAN STATIC ALARM CONDITION (–4" ADJ)
e. EMERGENCY FREEZE CONDITION
f. MANUAL COMMAND FROM THE OPERATOR'S WORKSTATION.

I. SUPPLY FAN CONTROL: THE SUPPLY FANS SHALL RUN CONTINUOUSLY TO MAINTAIN SETPOINT OF THE STATIC PRESSURE SENSOR LOWEST FROM SETPOINT OF THE MULTIPLE STATIC PRESSURE SENSORS. UPON THE FAULT OR FAILURE OF A FAN, IT SHALL BE TURNED OFF AND UNIT SHALL CONTINUE OPERATION WITH A SINGLE FAN.
a. MULTIPLE FAN APPLICATIONS: OPERATE FANS IN PARALLEL, MODULATING AT THE SAME SPEED. UPON THE FAULT OR FAILURE OF ONE OF THE FANS IN MULTIPLE FAN APPLICATIONS THE SECOND FAN SHALL IMMEDIATELY COME UNDER PRIMARY CONTROL AND ITS SPEED SHALL MODULATE, SUBJECT TO STATIC PRESSURE CONTROL SETPOINT. THE FAILED FAN SHALL SHUT OFF AND ITS ISOLATION DAMPER SHALL IMMEDIATELY CLOSE TO PREVENT BACKSPIN.
b. STATIC PRESSURE SETPOINTS ON EACH FLOOR SHALL BE RESET LOWER WHEN ALL BOX DAMPERS ARE CLOSED 70% OR LESS. STATIC PRESSURE SETPOINTS ON EACH FLOOR SHALL BE RESET HIGHER WHEN ANY AIR VALVE IS OPENED GREATER THAN 90%
c. FANS SHALL BE SUBJECT TO A MAXIMUM SPEED LIMIT OF 60Hz

J. EXHAUST FAN CONTROL INTERLOCK: THE EXHAUST FANS SHALL RUN CONTINUOUSLY, AND INTERLOCKED WITH AHU. SEE SEPARATE CONTROL DIAGRAM.

K. DISCHARGE AIR TEMPERATURE RESET: AIR HANDLER DISCHARGE AIR TEMPERATURE SHALL BE RESET HIGHER WHENEVER ALL EXTERIOR ZONE TERMINAL REHEAT VALVES ARE COMMANDED TO SOME OPEN POSITION SUBJECT TO A MAXIMUM RETURN RELATIVE HUMIDITY OF 60% AND NO BOX IS COMMANDED TO MAXIMUM COOLING. AIR HANDLER DISCHARGE AIR TEMPERATURE SHALL BE RESET LOWER WHENEVER ANY BOX IS AT MAXIMUM COOLING OR WHEN THE RETURN AIR HUMIDITY RISES ABOVE 55% SUBJECT TO A LOW LIMIT OF 50 DEGREES F (ADJ).

L. HOT WATER HEATING COIL: DURING OCCUPIED PERIODS, WHEN FAN IS RUNNING, MODULATE CONTROL VALVE IN SEQUENCE WITH THE COOLING VALVE TO MAINTAIN SUPPLY–AIR TEMPERATURE SETPOINT.
a. DURING DISABLE SHUTDOWN MODE, WHEN FAN IS OFF, MODULATE CONTROL VALVE TO MAINTAIN A LOW LIMIT TEMPERATURE OF 50 DEGREES F AT THE HEATING COIL DISCHARGE AND A LOW LIMIT HOT WATER RETURN TEMPERATURE OF 45 DEGREES F. MOUNT FREEZE STAT ON FACE OF COOLING COIL AND ALARM AT 35°F (ADJ).

M. COOLING COIL CONTROL: THE COOLING COIL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT IN SEQUENCE WITH THE HEATING COIL. MONITOR HIGH LEVEL IN CONDENSATE PAN AND ALARM WORKSTATION. DO NOT DISABLE UNIT IN ALARM CONDITION.

N. HUMIDIFIER CONTROL: WHEN FAN IS RUNNING SUPPLY HUMIDISTAT MODULATES HUMIDIFIER CONTROL VALVE TO MAINTAIN DISCHARGE HUMIDITY SETPOINT EQUAL TO HUMIDIFIER RATED PERFORMANCE LEAVING RH OF 77% (ADJ) VERIFY.
a. OPERATION SHALL BE SUBJECT TO AIRFLOW PROVING DEVICE.
b. CONTROLS SHALL BE SUBJECT TO MODULATING CONTROL OF HIGH LIMIT NOT TO EXCEED 90% RH (ADJ) IN DUCT.
c. IF ANY SYSTEM TEMPERATURE CONTROL OR POWER OR STEAM PRESSURE IS LOST HUMIDIFIER SHALL BE OFF. UPON RE–ESTABLISHING SYSTEM TEMPERATURE CONTROL, POWER, AND STEAM PRESSURE, DELAY START OF HUMIDIFICATION SYSTEM UNTIL ROOM TEMPERATURE HAS STABILIZED.

O. HEAT RECOVERY AND BY–PASS CONTROL:
a. MODULATE BYPASS DAMPER TO PREVENT HEAT PIPE DISCHARGE TEMP FROM DROPPING BELOW 36°F (ADJ) AND PREVENT HEAT RECOVERY FROM FROSTING HEAT PIPE.
b. MODULATE BYPASS DAMPER IN RESPONSE TO SUPPLY DISCHARGE TEMP SETPOINT TO PREVENT TOO MUCH ENERGY RECOVERY AND NEED FOR MECHANICAL HEATING, REHEATING, OR COOLING/RECOOLING.

P. FILTER BANKS: THE DIFFERENTIAL PRESSURE AT EACH FILTER BANK SHALL MONITORED AND WHEN A 95% LOADED LEVEL IS REACHED AS DETERMINED BY THE FILTER MANUFACTURER'S RECOMMENDATIONS, AN ALARM SHALL BE GENERATED.

2. ALARMS
a. CAUTIONARY ALARM WHEN UNOCCUPIED MODE IS OVERRIDDEN
b. UNIT STOPPED CONDITION
c. SINGLE SUPPLY FAN STOPPED CONDITION (TYP OF 2)
d. SINGLE SUPPLY FAN FAULT/FAILURE CONDITION (TYP OF 2)
g. SUPPLY SMOKE CONDITION
h. SUPPLY FAN DISCHARGE HIGH STATIC CONDITION
i. SUPPLY FAN INTAKE LOW STATIC CONDITION
j. EXHAUST SMOKE CONDITION
l. EXHAUST FAN INTAKE LOW STATIC CONDITION
m. FREEZE CONDITION
o. EXHAUST HUMIDITY HIGH/LOW CONDITIONS
p. LOW/HIGH OUTSIDE AIR FLOWS
q. LOW/HIGH UNIT DISCHARGE SUPPLY AIR TEMPERATURES
r. LOW/HIGH SUPPLY DUCT STATIC PRESSURES
s. LOW/HIGH FILTER BANK PRESSURES
t. OUTDOOR AIR DAMPERS FAILURE CONDITION

3. GRAPHICS
a. ALARM CONDITIONS
b. OCCUPIED/UNOCCUPIED MODE
c. SUPPLY FAN "A" STATUS
d. SUPPLY FAN "B" STATUS
e. SUPPLY FAN "A" SPEED
f. SUPPLY FAN "B" SPEED
g. SUPPLY FAN "A" AIR FLOW
h. SUPPLY FAN "B" AIR FLOW
i. TOTAL SUPPLY AIR FLOW
j. SUPPLY SYSTEM STATIC PRESSURES
k. DISCHARGE AIR TEMPERATURE
l. DISCHARGE AIR TEMPERATURE BASE SETPOINT
m. DISCHARGE AIR TEMPERATURE RESET SETPOINT
o. HW COIL VALVE COMMAND PERCENTAGE
p. HW COIL VALVE POSITION PERCENTAGE
q. HW COIL DISCHARGE AIR TEMPERATURE
r. CHW COIL VALVE COMMAND PERCENTAGE
s. CHW COIL VALVE POSITION PERCENTAGE
t. CHW COIL DISCHARGE AIR TEMPERATURE
u. OA DAMPER COMAND PERCENTAGES
v. OA DAMPER POSITION PERCENTAGES
w. OA DAMPER AIRFLOWS
x. OUTSIDE AIR TEMPERATURE (GLOBAL)
y. OUTSIDE AIR HUMIDITY (GLOBAL)
z. OUTSIDE AIR ENTHALPY (GLOBAL)
aa. FILTER DIFFERENTIAL PRESSURE
bb. HUMIDIFIER SUPPLY DUCT ENTERING RELATIVE HUMIDITY INDICATION
cc. HUMIDIFIER SUPPLY DUCT ENTERING TEMPERATURE INDICATION
dd. HUMIDIFIER SUPPLY DUCT LEAVING RELATIVE HUMIDITY INDICATION
ee. HUMIDIFIER SUPPLY DUCT LEAVING TEMPERATURE INDICATION
ff. HEAT PIPE SUPPLY AND EXHAUST INLET AND OUTLET TEMP AND HUMIDITY INDICATION
gg. HEAT PIPE OA BYPASS DAMPER COMMAND, POSITION

NOTE:
REFER TO MEP DRAWINGS FOR ADDITIONAL INFORMATION.

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ADDENDUM B

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HVAC CONTROLS

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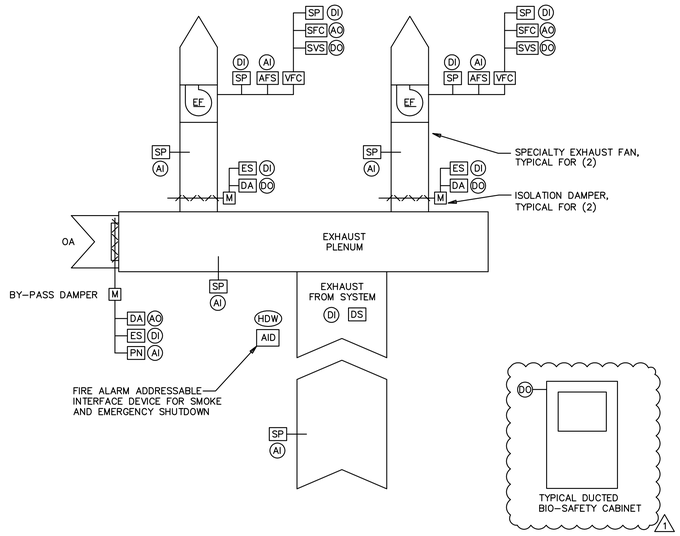
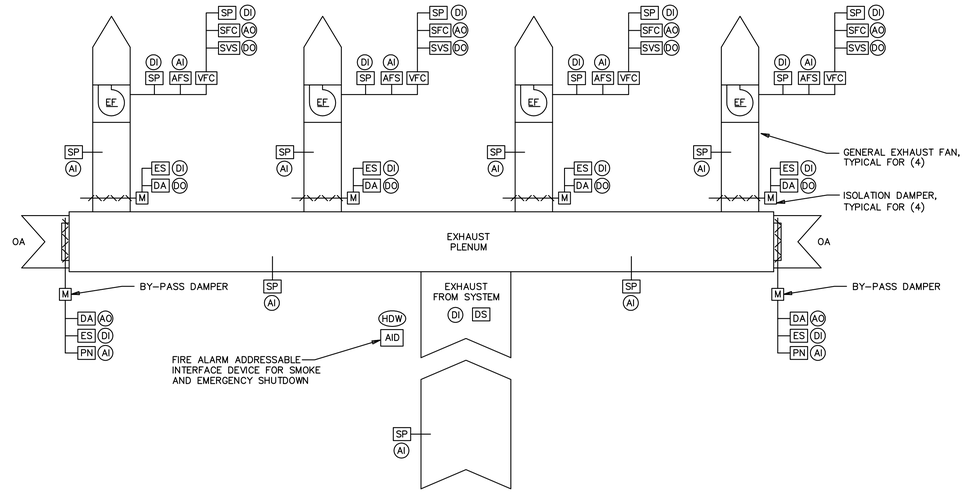


SPECIALTY EXHAUST EF-2A/2B
NOT TO SCALE

GENERAL EXHAUST FAN SYSTEM CONTROL
1. SEQUENCE OF OPERATION
 A. GENERAL: VARIABLE VOLUME HIGH PLUME EXHAUST SYSTEM INTERLOCKED WITH AHU-1.
 B. DISABLED CONDITION: WHENEVER THE SYSTEM IS SHUTDOWN OR DISABLED, THE BYPASS AND FAN ISOLATION DAMPERS SHALL BE CLOSED. WHENEVER A SINGLE FAN IS STOPPED ITS DEDICATED ISOLATION DAMPER SHALL BE CLOSED.
 C. OPTIMAL START/DEMAND LIMITING CONTROL:
  a. START COMMAND SHALL BE SEQUENCED SUBJECT TO THE BUILDING OPTIMAL START AND DEMAND LIMITING CONTROL:
  b. IN ANY EVENT WHERE MULTIPLE UNITS/EQUIPMENT ARE SHUTDOWN DOWN, SYSTEM SHALL SEQUENCE RESTART OF EQUIPMENT ONE AT A TIME IN A MANNER TO MINIMIZE DEMAND, BEGINNING WITH STEAM, THEN HYDRONICS AND THEN FOLLOWED BY AIRSIDE EQUIPMENT.
  c. MOTORIZED EQUIPMENT SHALL BE STAGGER STARTED
 D. STANDBY POWER MODE:
  a. IN THE EVENT OF LOSS OF BOTH NORMAL AND STANDBY POWER, ALL SYSTEMS SHALL BE DISABLED.
  b. DUAL SUPPLY FANS ARE POWERED FROM DIFFERENT BRANCHES OF POWER, ON FAN FROM NORMAL POWER AND ONE FROM STANDBY. SYSTEM SHALL MONITOR ATS AND STATUS OF BRANCH POWER. WITH LOSS OF EITHER BRANCH, FANS SHALL OPERATE AS INDICATED IN FAN CONTROL.
  c. BY MONITORING ATS, WHEN POWER RESTORED, FANS SHALL AUTOMATICALLY RESTART.
 E. RESET/START COMMAND: WHEN THE SYSTEM IS STARTED OR RESET, AHU COILS SHALL COME UNDER CONTROL FIRST, THEN SUPPLY AND EXHAUST AHU AND DUCT DISTRIBUTION SMOKE DAMPERS SHALL OPEN, SUPPLY/EXHAUST FAN ISOLATION DAMPERS SHALL OPEN AND, SUBJECT TO END SWITCHES ON THE DAMPER CLOSED POSITIONS THE FANS SHALL BE SENT A START COMMAND. SUPPLY AND EXHAUST FANS SHALL RAMP UP OVER 240 SECONDS (ADJ) WITH HEATING /COOLING COIL KEEPING PACE AND AT SETPOINT.
 F. SINGLE FAN START/STOP: WHEN ANY FAN STARTS ITS ISOLATION DAMPER SHALL BEGIN OPENING SIMULTANEOUSLY TO PREVENT BACKSPIN. IF THE END SWITCH SIGNAL IS NOT GIVEN WITHIN 60 SECONDS (ADJ) THE FAN SHALL BE SHUT DOWN, THE NEXT FAN SHALL START, THE ISOLATION DAMPER CLOSED AND AN ALARM GENERATED. FANS SHALL RAMP UP AND DOWN OVER A 120 SECOND PERIOD (ADJ). WHEN A FAN STOPS IT SHALL RAMP DOWN TO MINIMUM SPEED, THEN THE ISOLATION DAMPER SHALL CLOSE AND THE FAN SHALL STOP.
 G. FAN CONTROL: A MINIMUM OF ONE FAN SHALL RUN AT ALL TIMES UP TO (2) FANS MAXIMUM.. FANS SHALL RUN AT FULL SPEED WHEN RUNNING. WHEN THE TOTALIZED EXHAUST OF EACH AIR VOLUME CONTROL DEVICE RISES TO 70% OF THE AIR VOLUME OF THE FANS CURRENTLY RUNNING, ANOTHER FAN SHALL START. WHEN THE TOTALIZED EXHAUST OF EACH AIR VOLUME CONTROL DEVICE FALLS TO 60% OF THE AIR VOLUME OF THE FANS CURRENTLY RUNNING MINUS ONE, A FAN SHALL RAMP DOWN AND STOP. IF ANY FAN FAILS THE NEXT IN SERIES WILL START AUTOMATICALLY OR UPON FAILURE OR SHUTDOWN OR BOTH FANS, SIGNAL EACH DUCKTED BIO-SAFETY CABINET DRY CONTACTS TO ALARM PERSONNEL. 1
 H. STOP/SHUT-DOWN COMMAND: A SYSTEM STOP/SHUT-DOWN COMMAND CAN BE ISSUED MANUALLY AT THE OPERATOR'S WORKSTATION. WHEN A MANUAL SHUTDOWN OCCURS THE FANS SHALL RAMP DOWN ONE BY ONE TO MINIMUM IN 120 SECONDS (ADJ) AND STOP.
 I. LEAD/LAG FAN CONTROL: RUN TIME SHALL BE LOGGED CONTINUOUSLY. QUARTERLY FANS SHALL BE SET TO LEAD, LAG 1, STATUS BASED ON THE LEAST AMOUNT OF TOTAL LOGGED RUN TIME TO THE GREATEST TOTAL LOGGED RUN TIME. SWITCHOVER SHALL BE SCHEDULED FOR A SUNDAY AFTERNOON OR AS OWNER REQUIREMENTS DICTATE. FAN(S) NOW REQUIRED TO RUN SHALL RAMP UP ONE AT A TIME OVER 360 MINUTES EACH AND ONCE AT FULL SPEED, THE FAN(S) NOT REQUIRED TO RUN SHALL RAMP DOWN ONE BY ONE OVER 360 SECONDS. PROVIDE AN "OPERATOR'S DELAY" FUNCTION TO MANUALLY DELAY THE AUTOMATIC SWITCHOVER INDEFINITELY UPON OPERATOR INTERVENTION.
 J. BYPASS DAMPER CONTROL: THE BYPASS DAMPERS SHALL MODULATE IN SEQUENCE TO MAINTAIN THE GREATEST (MOST POSITIVE) DUCT STATIC PRESSURE SENSORS LOCATED ON EACH FLOOR.
2. ALARMS
 a. LEAD LAG SWITCHOVER 1 WEEK AWAY
 b. SWITCHOVER DELAY FUNCTION BY OPERATOR
 c. FAN MANUALLY STOPPED CONDITION (TYP OF 2)
 d. FAN FAULT/FAILURE CONDITION (TYP OF 2)
 e. DAMPER FAILURE
 f. SMOKE CONDITION
 g. PLENUM HIGH STATIC CONDITION
 h. PLUNUM LOW STATIC CONDITION
 i. DUCT HIGH STATIC CONDITION
 j. DUCT LOW STATIC CONDITION
 k. FREEZE CONDITION
3. GRAPHICS
 a. ALARM CONDITIONS
 b. FAN LEAD LAG 1, STATUS
 c. NEXT LEAD LAG STATUS CHANGE DATE
 d. MANUAL LEAD/LAG SWITCHOVER DELAY
 e. FAN STATUS (TYP OF 2)
 f. FAN SPEED (TYP OF 2)
 g. ISOLATION DAMPER STATUS
 h. TOTALIZED EXHAUST AIR FLOW BY FLOOR AND WING
 i. DUCT STATIC PRESSURES (MULTIPLE)
 j. DUCT STATIC PRESSURE SETPOINTS (MULTIPLE)
 k. PLENUM STATIC PRESSURES
 l. PLENUM STATIC PRESSURE HIGH/LOW SETPOINTS
 m. BYPASS DAMPERS COMMAND PERCENTAGE



GENERAL EXHAUST EF-1A THRU EF-1D SYSTEM CONTROL
NOT TO SCALE

GENERAL EXHAUST FAN SYSTEM CONTROL
1. SEQUENCE OF OPERATION
 A. GENERAL: VARIABLE VOLUME HIGH PLUME EXHAUST SYSTEM INTERLOCKED WITH AHU-1.
 B. DISABLED CONDITION: WHENEVER THE SYSTEM IS SHUTDOWN OR DISABLED THE BYPASS AND FAN ISOLATION DAMPERS SHALL BE CLOSED. WHENEVER A SINGLE FAN IS STOPPED ITS DEDICATED ISOLATION DAMPER SHALL BE CLOSED.
 C. OPTIMAL START/DEMAND LIMITING CONTROL:
  a. START COMMAND SHALL BE SEQUENCED SUBJECT TO THE BUILDING OPTIMAL START AND DEMAND LIMITING CONTROL:
  b. IN ANY EVENT WHERE MULTIPLE UNITS/EQUIPMENT ARE SHUTDOWN DOWN, SYSTEM SHALL SEQUENCE RESTART OF EQUIPMENT ONE AT A TIME IN A MANNER TO MINIMIZE DEMAND, BEGINNING WITH STEAM, THEN HYDRONICS AND THEN FOLLOWED BY AIRSIDE EQUIPMENT.
  c. MOTORIZED EQUIPMENT SHALL BE STAGGER STARTED
 D. STANDBY POWER MODE:
  a. IN THE EVENT OF LOSS OF BOTH NORMAL AND STANDBY POWER, ALL SYSTEMS SHALL BE DISABLED.
  b. DUAL SUPPLY FANS ARE POWERED FROM DIFFERENT BRANCHES OF POWER, ON FAN FROM NORMAL POWER AND ONE FROM STANDBY. SYSTEM SHALL MONITOR ATS AND STATUS OF BRANCH POWER. WITH LOSS OF EITHER BRANCH, FANS SHALL OPERATE AS INDICATED IN FAN CONTROL.
  c. BY MONITORING ATS, WHEN POWER RESTORED, FANS SHALL AUTOMATICALLY RESTART.
 E. RESET/START COMMAND: WHEN THE SYSTEM IS STARTED OR RESET, AHU COILS SHALL COME UNDER CONTROL FIRST, THEN SUPPLY AND EXHAUST AHU AND DUCT DISTRIBUTION SMOKE DAMPERS SHALL OPEN, SUPPLY/EXHAUST FAN ISOLATION DAMPERS SHALL OPEN AND, SUBJECT TO END SWITCHES ON THE DAMPER CLOSED POSITIONS THE FANS SHALL BE SENT A START COMMAND. SUPPLY AND EXHAUST FANS SHALL RAMP UP OVER 240 SECONDS (ADJ) WITH HEATING /COOLING COIL KEEPING PACE AND AT SETPOINT.
 F. SINGLE FAN START/STOP: WHEN ANY FAN STARTS ITS ISOLATION DAMPER SHALL BEGIN OPENING SIMULTANEOUSLY TO PREVENT BACKSPIN. IF THE END SWITCH SIGNAL IS NOT GIVEN WITHIN 60 SECONDS (ADJ) THE FAN SHALL BE SHUT DOWN, THE NEXT FAN SHALL START, THE ISOLATION DAMPER CLOSED AND AN ALARM GENERATED. FANS SHALL RAMP UP AND DOWN OVER A 120 SECOND PERIOD (ADJ). WHEN A FAN STOPS IT SHALL RAMP DOWN TO MINIMUM SPEED, THEN THE ISOLATION DAMPER SHALL CLOSE AND THE FAN SHALL STOP.
 G. FAN CONTROL: A MINIMUM OF ONE FAN SHALL RUN AT ALL TIMES UP TO (3) FANS MAXIMUM.. FANS SHALL RUN AT FULL SPEED WHEN RUNNING. WHEN THE TOTALIZED EXHAUST OF EACH AIR VOLUME CONTROL DEVICE RISES TO 70% OF THE AIR VOLUME OF THE FANS CURRENTLY RUNNING, ANOTHER FAN SHALL START. WHEN THE TOTALIZED EXHAUST OF EACH AIR VOLUME CONTROL DEVICE FALLS TO 60% OF THE AIR VOLUME OF THE FANS CURRENTLY RUNNING MINUS ONE, A FAN SHALL RAMP DOWN AND STOP. IF ANY FAN FAILS THE NEXT IN SERIES WILL START AUTOMATICALLY.
 H. STOP/SHUT-DOWN COMMAND: A SYSTEM STOP/SHUT-DOWN COMMAND CAN BE ISSUED MANUALLY AT THE OPERATOR'S WORKSTATION. WHEN A MANUAL SHUTDOWN OCCURS THE FANS SHALL RAMP DOWN ONE BY ONE TO MINIMUM IN 120 SECONDS (ADJ) AND STOP.
 I. LEAD/LAG FAN CONTROL: RUN TIME SHALL BE LOGGED CONTINUOUSLY. QUARTERLY FANS SHALL BE SET TO LEAD, LAG 1, LAG 2, LAG 3 STATUS BASED ON THE LEAST AMOUNT OF TOTAL LOGGED RUN TIME TO THE GREATEST TOTAL LOGGED RUN TIME. SWITCHOVER SHALL BE SCHEDULED FOR A SUNDAY AFTERNOON OR AS OWNER REQUIREMENTS DICTATE. FAN(S) NOW REQUIRED TO RUN SHALL RAMP UP ONE AT A TIME OVER 360 MINUTES EACH AND ONCE AT FULL SPEED, THE FAN(S) NOT REQUIRED TO RUN SHALL RAMP DOWN ONE BY ONE OVER 360 SECONDS. PROVIDE AN "OPERATOR'S DELAY" FUNCTION TO MANUALLY DELAY THE AUTOMATIC SWITCHOVER INDEFINITELY UPON OPERATOR INTERVENTION.
 J. BYPASS DAMPER CONTROL: THE BYPASS DAMPERS SHALL MODULATE IN SEQUENCE TO MAINTAIN THE GREATEST (MOST POSITIVE) DUCT STATIC PRESSURE SENSORS LOCATED ON EACH FLOOR.
2. ALARMS
 a. LEAD LAG SWITCHOVER 1 WEEK AWAY
 b. SWITCHOVER DELAY FUNCTION BY OPERATOR
 c. FAN MANUALLY STOPPED CONDITION (TYP OF 4)
 d. FAN FAULT/FAILURE CONDITION (TYP OF 4)
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3. GRAPHICS
 a. ALARM CONDITIONS
 b. FAN LEAD LAG 1, LAG 2, LAG 3 STATUS
 c. NEXT LEAD LAG STATUS CHANGE DATE
 d. MANUAL LEAD/LAG SWITCHOVER DELAY
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 m. BYPASS DAMPERS COMMAND PERCENTAGE

NOTE:
REFER TO MEP DRAWINGS FOR ADDITIONAL INFORMATION.

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Vivarium Tower Renovation

Center for Laboratory Animal Care

Building B
263 Farmington Avenue
Farmington, Connecticut 06030

Mechanical Engineer/Structural Engineer

BVH Intergrated Services

50 Griffin Road South
Bloomfield, CT 06002
P: 860.286.9171
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ADDENDUM B

NO	ISSUE	DATE
1	ADDENDUM B	08/16/13

Sheet Information

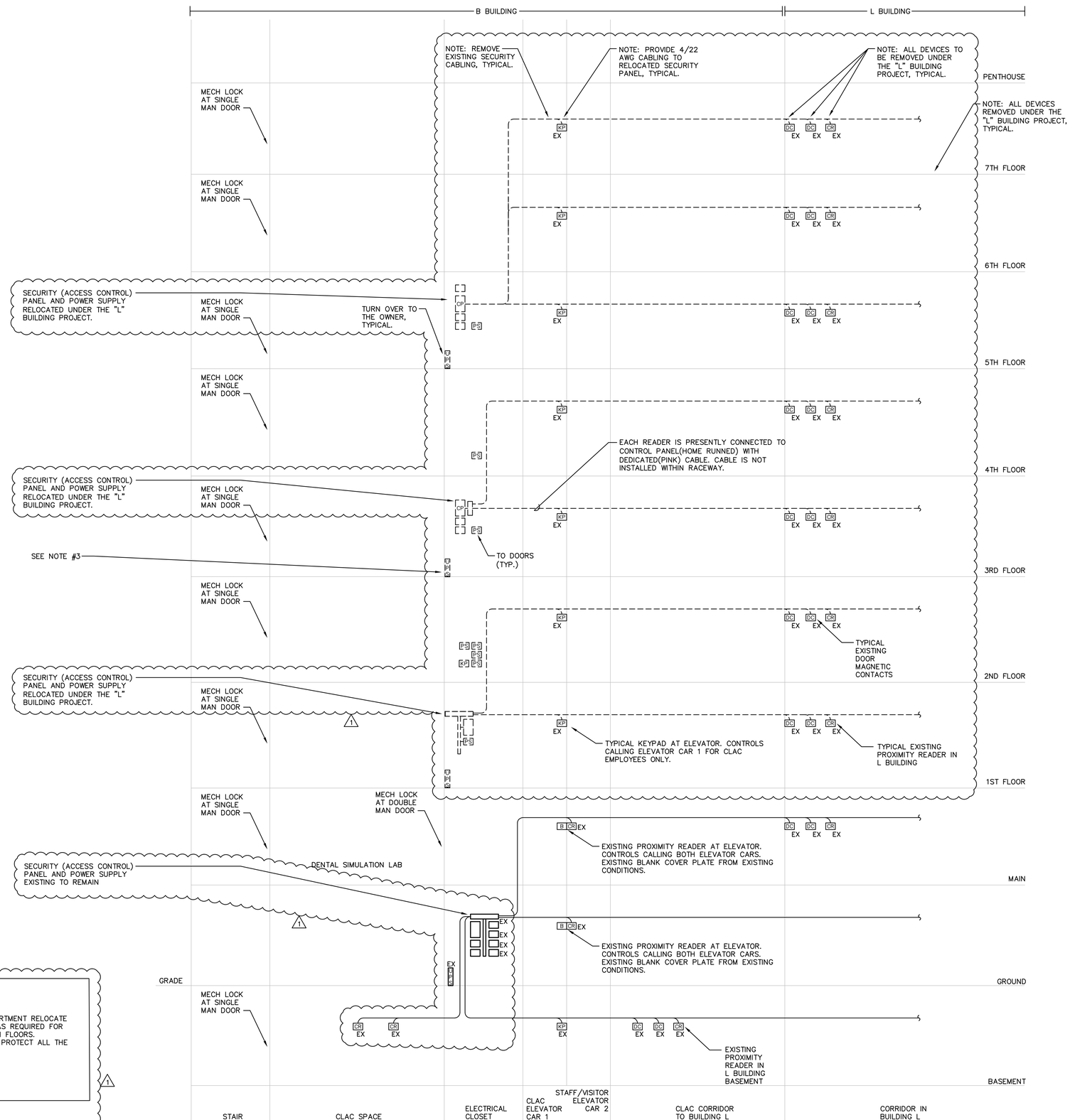
Date	16 AUGUST, 2013
Job Number	155064.000
Drawn	KLB
Checked	JRD
Approved	GI

Title

HVAC CONTROLS

Sheet

H-604



EXISTING ACCESS CONTROL SYSTEM
SCALE: NOT TO SCALE

GENERAL NOTES

ARRANGE/COORDINATE TO HAVE UCHC IT DEPARTMENT RELOCATE ANY REMAINING ACCESS CONTROL EQUIPMENT AS REQUIRED FOR THE ELECTRICAL ROOMS ON 1ST, 3RD, AND 5TH FLOORS.
DURING CONSTRUCTION OF ELECTRICAL ROOMS, PROTECT ALL THE FOLLOWING EXISTING CABLES:

- 24 STRAND F.O. CABLE (YELLOW)
- 2 STRAND F.O. CABLE (ORANGE)
- MULTIPLE PAIR CABLE (PINK)
- MULTIPLE PAIR CABLE (GREY)

NOTES:

1. EQUIPMENT WITHIN B BUILDING ELECTRICAL CLOSET SERVICE DEVICES IN BUILDING B, L, AND A.
2. SYSTEM WAS INSTALLED BY JCI.

NOTE:
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Title

TELECOMMUNICATION RISER

Sheet

T-301